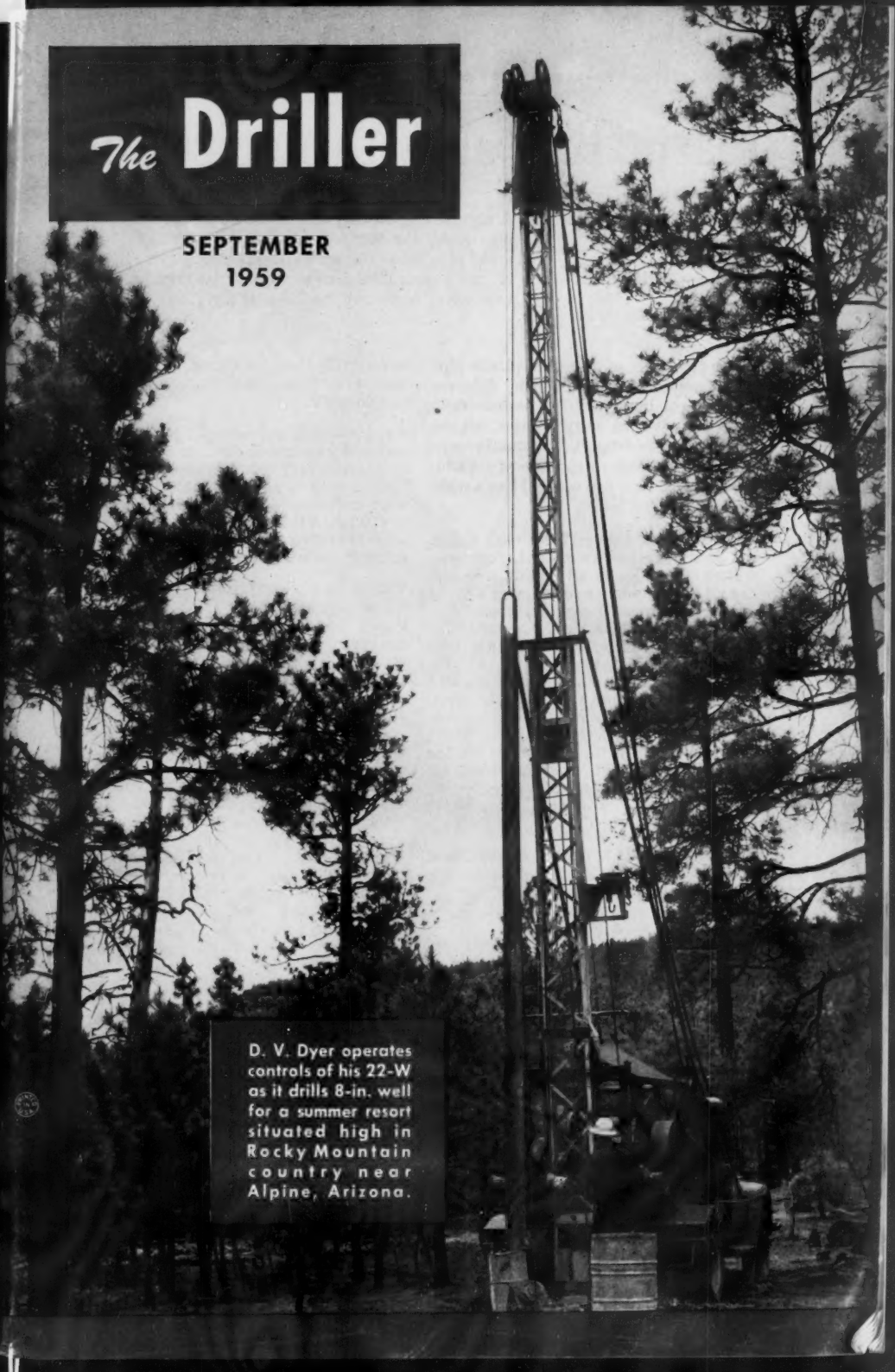
The Driller

SEPTEMBER
1959



D. V. Dyer operates controls of his 22-W as it drills 8-in. well for a summer resort situated high in Rocky Mountain country near Alpine, Arizona.

FIRST in the Field

Plastic Pipe ad with no picture?

Why no picture?

A picture can be deceiving. Almost all plastic pipe looks the same...some even looks like metal pipe. The difference is a matter of service ...and piping that goes wrong can be mighty expensive. A picture means nothing...but...

There are scores of brands of plastic pipe on the market...made of many different kinds of plastic materials...wonderfully improved over the early plastics. All are labeled "rust resistant"...but total results may be good, bad, or indifferent depending on the choice you make. Here's what to look for:

The universal material? No such thing. No one plastic (no *metal*, for that matter) can handle *all* liquids...no one has all the properties required of a truly universal pipe. Closest to it are Ace Riviclor (Rigid PVC) and Ace-Ite (ABS rubber-plastic blend). Riviclor is a little better on chemical resistance, and Ace-Ite is a little better on impact strength and heat resistance. Both cost about the same, are rigid, and come in 20′ lengths. Ace Supplex (Polyethylene) is flexible; comes in 100′ to 400′ coils. All are OK for drinking water and also for chemicals used in treating water. Of course they're immune to rust, rot, soil and electrolytic corrosion.

Are plastics fully approved for drinking water? Yes...the National Sanitation Foundation at University of Michigan attests with this seal that they regularly test Ace Riviclor, Ace-Ite, Ace Supplex and certain of our other brands of plastic pipe, and certify them non-toxic. These materials are odorless and tasteless as well as non-toxic.

Are plastics strong enough? Hundreds of water works and thousands of chemical plants (all very critical people) say *yes!* Plastic pipe is now available in several wall thicknesses for working pressures to 490 psi. It takes plenty of hard knocks, and resists accidental cutting and damage quite satisfactorily.

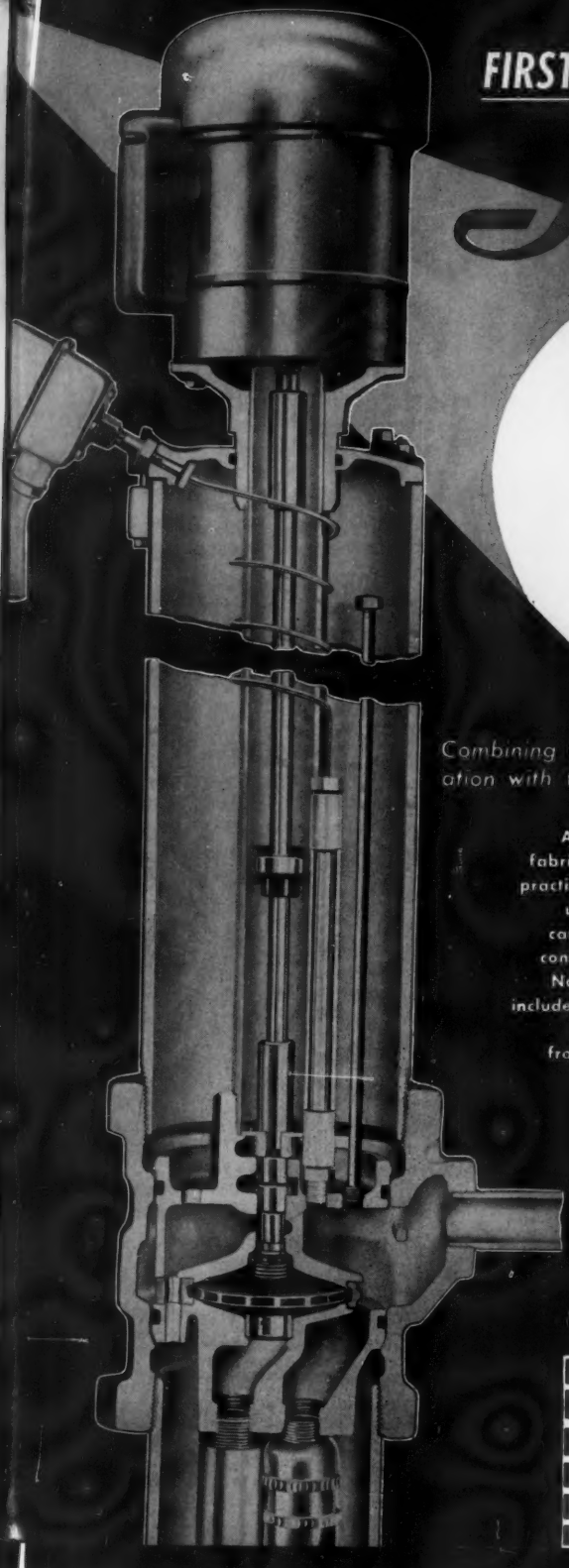
Where do I use it? For wells and farm water systems. For construction job water lines, industrial piping, mine drainage systems. For lawn and golf course sprinklers...recirculating water lines in air-conditioning. We've supplied miles of pipe for successful installations. If you haven't yet put some underground for test, it's time to start. Nothing takes the place of *personal* experience.

How can I dodge the pitfalls of "trial and error?" Go to a company that has no axe to grind...a company with the widest experience. We, for instance, supply eight different kinds of pipe...with fittings and valves to match. For truly unbiased advice...backed by 100 years of experience...and prices as low as you'll find anywhere... come to American Hard Rubber Company.

★

Write John R. MacKay, 200 East 42nd Street, New York 17, N.Y. for literature kit ARS-1; most complete information available from any manufacturer. No cost or obligation.

ACE Rubber & Plastics Equipment
by **AMERICAN** Hard Rubber Company
division of **AMERACE** Corporation



FIRST in the Field . . .

THE NEW

Monitor

PJ

Combining the sealed safety of ..tless install-ation with the economy of the ..et pump

A completely new idea in water system pre-fabrication . . . beautifully simple, efficient, and practical. The PJ is an entirely new pitless-pump unit which forms the upper part of the well casing and provides complete sealing against contamination meeting the strictest well codes. No pit or heated enclosure is needed. The PJ includes a specially designed centrifugal jet pump mounted within the well casing below the frost line. Only a single line of pipe from the well is used—eliminating the return pipe ordinarily needed with jet installations, with the resulting advantages: 1) Substantially reduced installation, labor and pipe cost. 2) No pipe enclosure required . . . line is always under pressure. 3) No chronic jet clogging from pipe scale. 4) Shorter water circuit increases efficiency.

Begin your PJ installations with your next job. Mail this coupon for additional information.

BAKER MFG. COMPANY Evansville, Wis.

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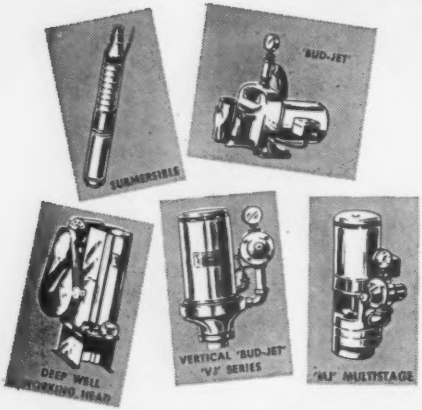
AERMOTOR

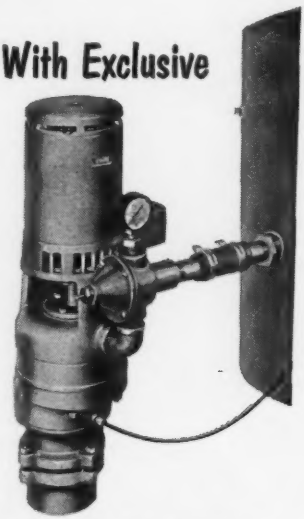
The Complete Line for '59



Now — here's the line with everything you need to capture sales in the BIG VOLUME farm and home pump market. Choose from over one hundred models — be certain you get the pump that's tailored to your job's specific requirements.

AND Aermotor's selling program is tailored to your requirements too! You get BIGGER discounts with Aermotor's contract purchase plan . . . PLUS the support of a consistent consumer advertising program . . . PLUS Aermotor's liberal co-op advertising program. It all adds up to a big year for you — when you sell the line your customers trust — Aermotor.

NEW! 'MJ' Multistage Jet Pump With Exclusive Aermotor "Work Saver" Adapters— Designed to Make Every Job Quicker . . . Cheaper . . . Easier!



The "MJ" is shipped ready to install. No "on the job" connection of regulating valve, pressure gauge, etc. It's all done at the factory. Exclusive "work saver" adapters cut down on lengthy (and expensive) pipe fitting operations . . . give you neat, sure jobs every time. AND you actually save parts! All adapters have built-in slip couplings — offset adapters have side outlets — require no extra fittings at the pump.

Ask to See the New Aermotor 'MJ' . . . TODAY!

Branches: AMARILLO • CORDELE, GA. • DALLAS • DES MOINES • HARRISBURG
KANSAS CITY • MINNEAPOLIS • OMAHA

AERMOTOR
"WATER WHERE YOU WANT IT"

"Since 1888, Manufacturers of Quality Water Pumping Equipment"

AERMOTOR COMPANY

2500 W. ROOSEVELT ROAD, CHICAGO 8, ILLINOIS

CITY _____

The Driller

South Milwaukee, Wisconsin

Vol. 33 No. 9

September 1959

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Field designed for severe jarring this Low Cost-High Efficiency Fishing Socket will be a welcome asset to your fishing string.

Let RAMPP Company furnish you with the complete line of Fishing Tools of Dependability.

Write for RAMPP CATALOG —
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RAMCO—10753

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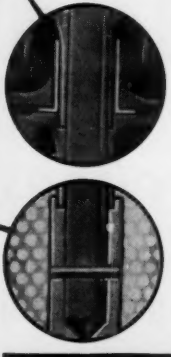
NEW! IMPROVEMENTS IN

AURORA®

Submersible PUMPS

ASSURE LONG-LIFE WATER SUPPLY

HOMES • FARMS • INSTITUTIONS



NYLON BEARINGS

The ideal bearing material—NYLON—is retained in solid brass walls where there can be *no distortion.* This new design feature assures longer life and exceptional bearing performance.

RIGID CONNECTOR ASSEMBLY

Long-term dependable operation is assured with the retention of true operating unity between pump and motor that has been attained by the use of the new rigid connector assembly.

- FOR 4" AND LARGER WELLS
- CAPACITIES TO 2100 GPM
- WATER LEVELS TO 400 FT.
- CORROSION-RESISTANT, FACTORY SEALED PERMANENTLY LUBRICATED U.S. MOTOR
- NOISELESS, FREEZEPROOF
- EASY ONE-PIPE INSTALLATION

SEE YOUR AURORA DISTRIBUTOR
OR WRITE TODAY FOR BULLETIN 130

AURORA Always PUMPS

AURORA PUMP DIVISION
THE NEW YORK AIR BRAKE COMPANY
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REDA Submergible PUMPS

- **Complete range of pumps for all applications—1/3 to 300 H.P.**
- **Easiest to install—no pump house; single pipe from pump to tank**
- **Lowest maintenance—lubricated for life; corrosion-resistant**
- **MORE WATER PER DOLLAR—FULLY WARRANTIED—SILENT OPERATION**

Reda Submergible Pumps are *proven* to be "The Best Pump . . . The Best Buy! *OVER 100,000 units have been installed!* Forty years of experience by the pioneer and largest manufacturer of submergible electric motors and pumps is back of every dependable Reda Submergible Pump . . . acknowledged as *leader of the field* by pump buyers everywhere! In addition, *only REDA* provides a complete cooperative advertising program, backed up by a national advertising campaign, that is directed *100%* to the submergible pump market! Find out if *you* can qualify to be a Reda dealer . . . write today for complete information!

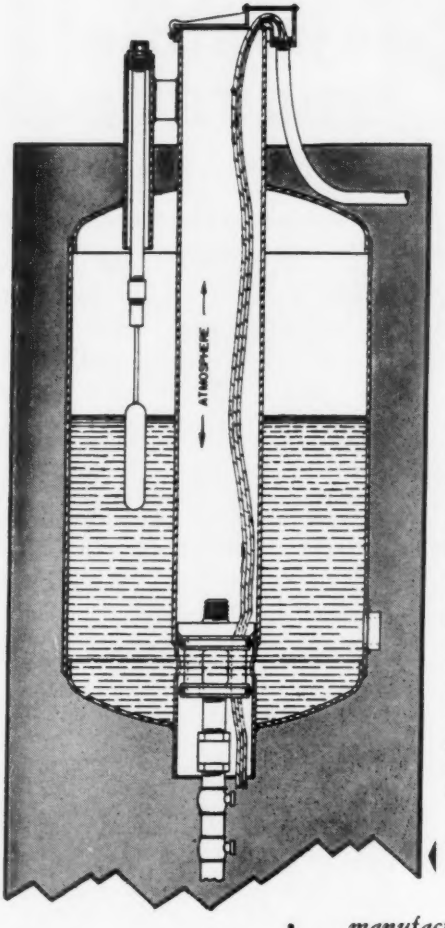
SIGN OF QUALITY SUBMERGIBLE REDA PUMPS

REDA PUMP COMPANY

BARTLESVILLE, OKLAHOMA

World's Largest Manufacturer of Submergible Pumps for Oil, Brine, Water, Gasoline, Jet Fuel, Chemicals and LPG.

TUBBS SUBMERSIBLE PITLESS ADAPTER TANK



CUT-AWAY VIEW OF 6-IN. 60 GAL. GRADE-A SHOWING STRAIGHT THRU EYE VIEW.

CAPACITIES FROM 40 TO 315 GAL.

These units meet the most rigid state and federal codes, including Wisconsin grade-A, providing true full-height well balanced installations. Sizes range from 40-gal. thru 315-gal. with 4", 5", 6" or 8" Tubbs Sanitary Pitless Adapter fitted within, from end to end. Standard "tall" and "squat" styles available.

Give your submersible pump installations the finest serviceability possible by using Tripar-Tubbs designed Sanitary Pitless Adapter Tanks. No need to ever have to "dig up" your jobs later for pump and motor repairing, or air-bleeder replacement or well screen cleaning. No danger of pressure loss thru top-flange gaskets. The inside well diameter is never reduced nor obstructed. Patented sanitary topside seal with cable box included.

THE ACCENT'S ON *Simplicity* TRIPAR ENGINEERING DESIGNS

manufactured and guaranteed by

WHITEWATER MANUFACTURING CO.
WHITEWATER, WISCONSIN

Get into the
EXCAVATING BUSINESS
in a big way with a *fast-moving* BUCYRUS-ERIE

Here's how to expand your business in a direction that is both profitable and ties in with your present operations!

The mobile ⅜-yd Bucyrus-Erie 11-B is the ideal excavator for handling basement excavating, digging footings, sewer trenching, septic tank installations and a hundred other money-making jobs at scattered locations!

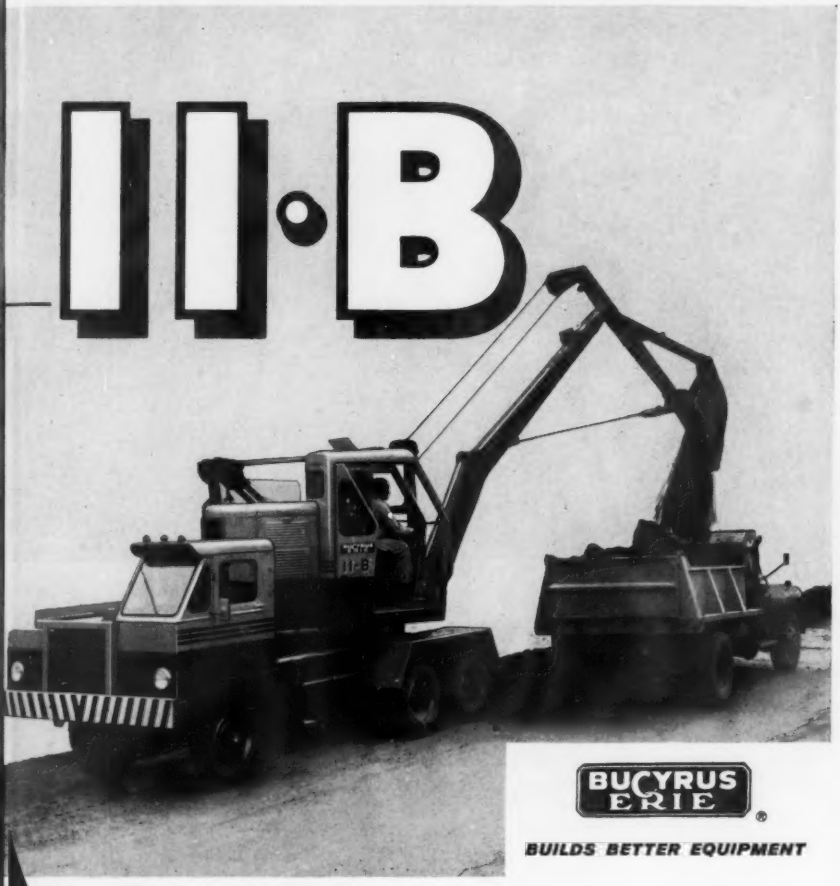
Mounted on a specially designed carrier, the fast-moving 11-B drives over the highways or city streets, maneuvers easily in the right spots.

It is completely convertible to work as a hoe, crane, dragline, shovel or clamshell . . . handles a half-yard concrete bucket with ease.

Fill out the coupon and mail now!

With a mobile Bucyrus-Erie 11-B excavator, you can bring in extra profits from dozens of "outside" jobs . . . provide more complete service to your well customers.

11-B



BUCYRUS ERIE®

BUILDS BETTER EQUIPMENT

BUCYRUS-ERIE COMPANY, DEPT. 91E
South Milwaukee, Wisconsin

Gentlemen: I'd like to ☐ have more information
☐ see a demonstration of the mobile 11-B crane-excavator!

Name.....

Address.....

City..... State.....

Over 200 wells old, this wire rope works like new

"This wire rope had already punched in more than 200 wells when I bought the rig," says Mike Kubina of Vanderbilt, Pa. "The rope was in excellent shape then and it still is!"

USS American Tiger Brand Mor-Spring Drilling Lines give long service because they are designed for the toughest well-drilling jobs. Notice the cross section. Those outside wires are heavier so that they will wear better in the most abrasive rock and shale you will ever hit. The smaller inner wires and fibre core give just the right combination of flexibility and spring for fast drilling action.

This is why drillers have told us that Tiger Brand has cut their rope costs as much as 50%. You can save, too. Ask for Tiger Brand when you buy wire rope.

For more information, write to American Steel & Wire, 614 Superior Ave., N.W., Cleveland 13, Ohio.

American Steel & Wire
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United States Steel

USS

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
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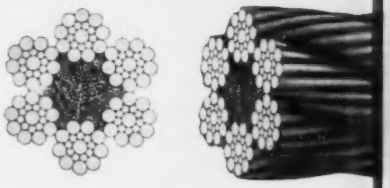
It's USS Tiger Brand—
America's No. 1 Wire Rope



Why Tiger Brand is your best buy

1. It is made by a company that maintains the most complete wire rope research and manufacturing facilities in the country.
2. It is designed by one of the country's largest staffs of wire rope engineers. It is serviced by field representatives who will answer any call.
3. Every type of Tiger Brand Wire Rope is designed for specific applications. You get the right rope for the job.
4. It is made by one company, U. S. Steel, and every step of production, from ore to finished product, is carefully controlled and supervised to guarantee one high standard of quality.
5. Tiger Brand Wire Rope is manufactured by the largest single producer in the country.

USS, American and Tiger Brand are registered trademarks

ANOTHER FIRST FROM STA-RITE

. . . again proving better pumps can be built, with new ideas in plast

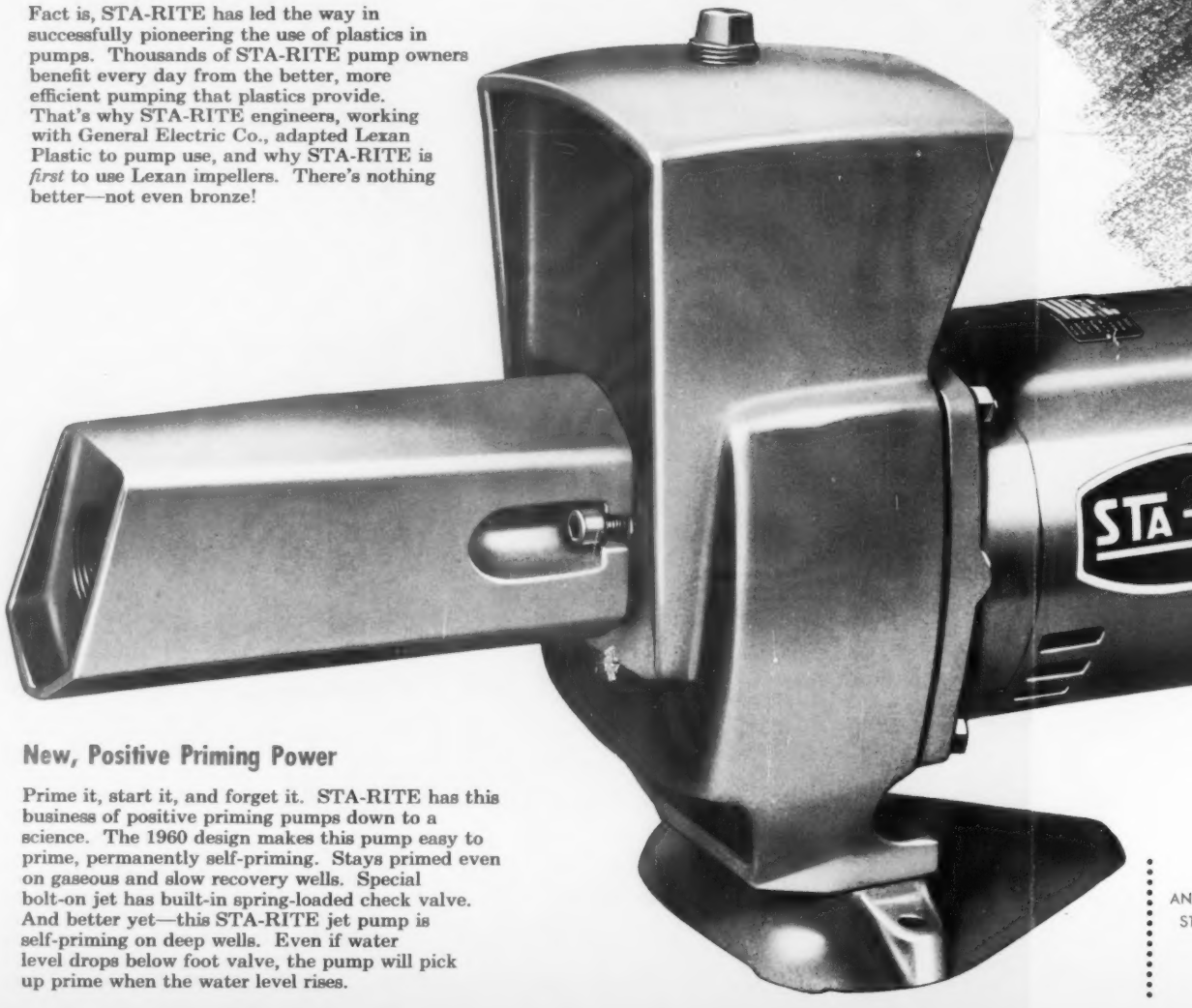
Modern Sta-Rite Pumps . . . First to Use LEXAN, the New General Electric Plastic

Take a ¼″ nail made of plastic. Sharpen it in a pencil sharpener. Then hammer it as hard and often as you can to drive it through 1″ plywood. *Tough?* You bet this plastic is tough! General Electric Co., developers of Lexan resin, uses this amazing demonstration to show the impact strength of this material.

Fact is, STA-RITE has led the way in successfully pioneering the use of plastics in pumps. Thousands of STA-RITE pump owners benefit every day from the better, more efficient pumping that plastics provide. That's why STA-RITE engineers, working with General Electric Co., adapted Lexan Plastic to pump use, and why STA-RITE is *first* to use Lexan impellers. There's nothing better—not even bronze!

New Self-Priming Convertible Jet Pump

New 1960 styling—handsome, styled to be seen. Installs anywhere, shallow or deep well to 130 feet. Equally efficient as shallow well, with jet bolted on to pump, or as double pipe deep well, in 4″ or larger wells. Jet has built-in check valve.

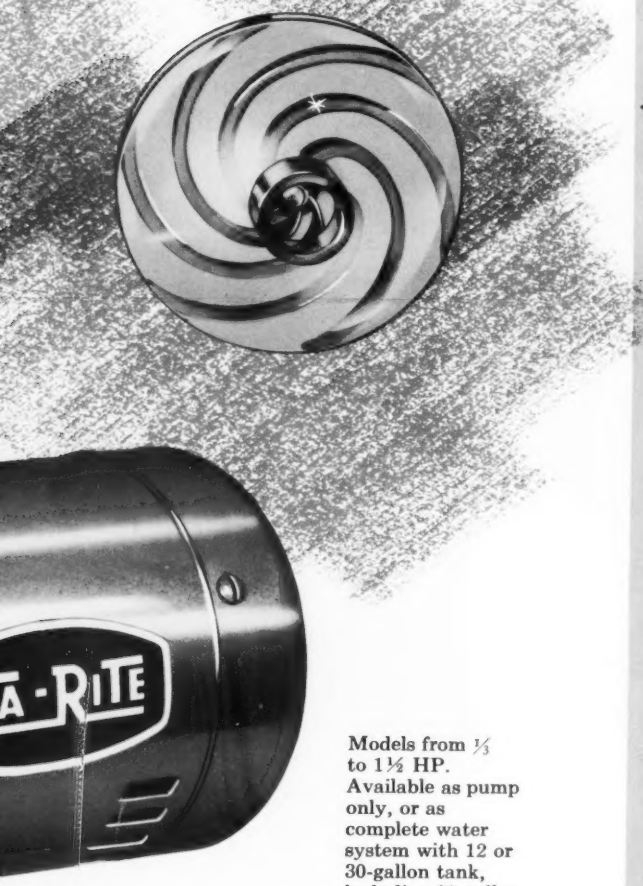


New, Positive Priming Power

Prime it, start it, and forget it. STA-RITE has this business of positive priming pumps down to a science. The 1960 design makes this pump easy to prime, permanently self-priming. Stays primed even on gaseous and slow recovery wells. Special bolt-on jet has built-in spring-loaded check valve. And better yet—this STA-RITE jet pump is self-priming on deep wells. Even if water level drops below foot valve, the pump will pick up prime when the water level rises.

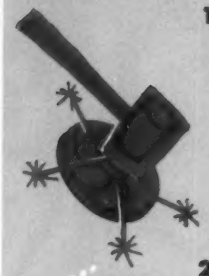
THE STA-RITE IMPELLER MADE OF NEW LEXAN® PLASTIC

astics and pump design



Models from ⅓ to 1½ HP. Available as pump only, or as complete water system with 12 or 30-gallon tank, including 30-gallon glass-lined tanks.

ANOTHER "SILVER ANNIVERSARY" STA-RITE PUMP. 1960 designed for maximum simplicity and installation, best service.



1. BEAT IT!

Pound it with a hammer . . . exceptional impact strength. Malleable, resists chipping and cracking. Can you do it with bronze?

2. BOIL IT!

Use a pressure cooker . . . this impeller withstands 280 degrees F. without distorting. A Lexan impeller operated three weeks in our lab at 275 degrees without any sign of warp or wear. Heard anyone else make such a claim?

3. BOUNCE IT!

Drop it from a high building . . . throw it down on concrete as hard as you can. It bounces . . . but bouncing won't harm the Lexan impeller. Can you do that with bronze?

4. BRAISE IT!

Pump sand with it . . . it withstands abrasive wear better than bronze impellers.

5. BREW IT!

In water, dilute acids or petroleum products, it will not swell, soften or change dimension and shape.

6. BULLY IT!

Take a screw-driver and try prying it apart . . . it is solvent-welded together for a permanent bond. Would others dare make this test?

7. BITE IT!

It's tough, hard, strong. Don't worry about breaking this impeller.

8. BREED IT!

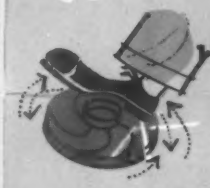
Use it in any solution you will ever encounter in the water systems business, including well-cleanouts. It'll stand it all, in the same shape, size, and form.

9. BREATHE IT!

No smell, no affinity for other odors. It just does not associate with odors as some other plastics do.

10. BRUSH IT!

By eye or finger, note the mirror-smooth surfaces. Much higher efficiency results from less friction in the water passageways. Have you seen the inside waterways of a bronze impeller, just for comparison?



11. BRUISE IT!

Try abusing it. We'll send you an impeller cross section for bruising or abusing, free of charge. Can you ask more?

12. BELIEVE IT!

These statements are based upon data from General Electric Co. tests and the results of our own laboratory tests.

13. BUY IT!

STA-RITE is so sure of the quality of Lexan plastic impellers that we unconditionally guarantee them for one year after installation of a STA-RITE pump. Pump in sand, acid water, what-have-you, with confidence in this STA-RITE guarantee.

That's a "pump dealer's dozen" . . . the biggest NEW "dealer's dozen" in the domestic pump and water systems industry today. Yes, LEXAN plastic impellers are an important NEW STA-RITE first—always and progressively—the FIRST with the BEST.

new

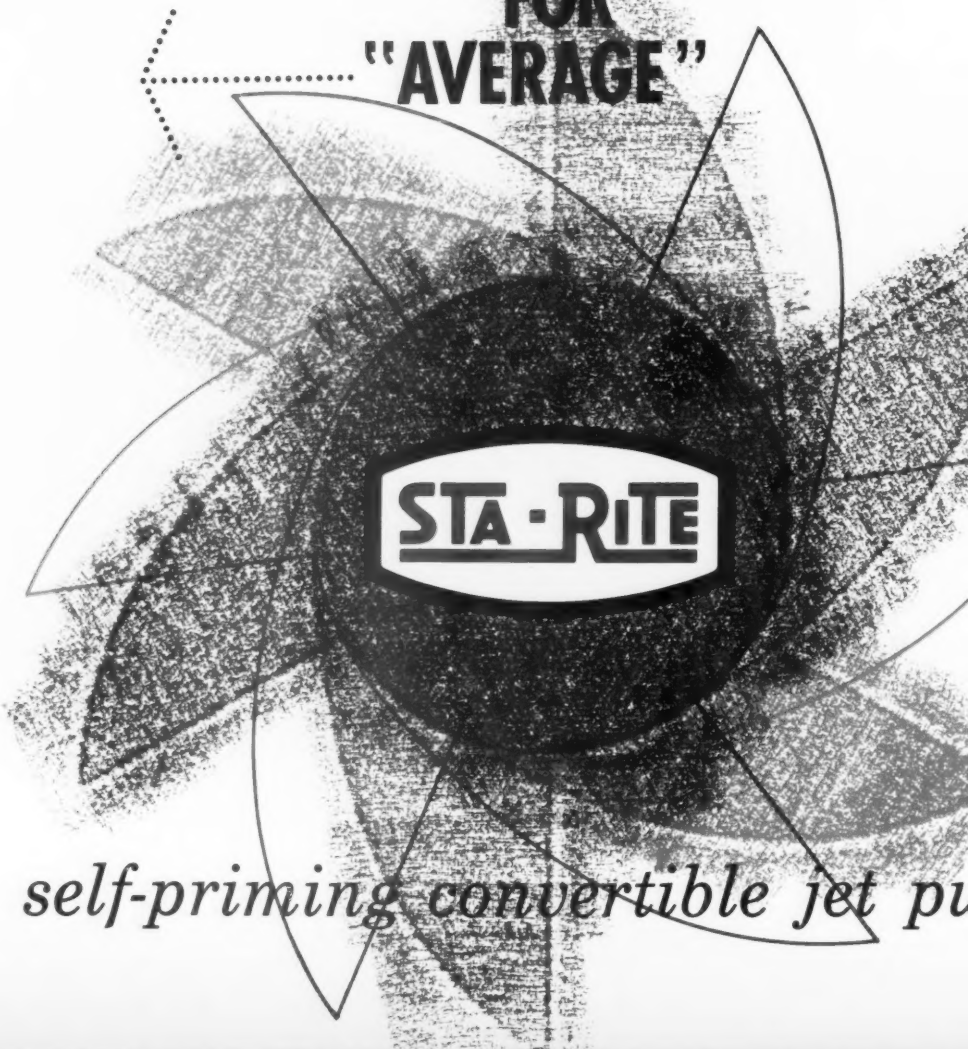
General Electric

LEXAN®

PLASTIC

FOR THE PUMP DEALER WHO WON'T SETTLE FOR "AVERAGE"

...plus positive priming power give this new Sta-Rite convertible jet pump a real selling edge



self-priming convertible jet pu

*Registered Trademark, General Electric Co.

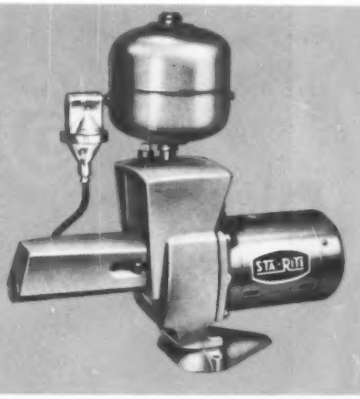
VERSATILE
VERSATILE
VERSATILE

STA-RITE PUMPS

You can sell Sta-Rite quality for every kind of jet installation. Convertible "three-way" installation, deep well or shallow well.

SERIES SL CONVERTIBLE — Use as shallow, convertible or deep well pump. Special shallow well jet with built-in check valve bolts on for initial use on shallow wells to 25 feet. Capacity to 1240 GPH.

HIGH CAPACITY SHALLOW WELL JET MODEL SN — Capacity to 2100 GPH. Complete water systems for shallow well use only. Compact direct pressure system illustrated is complete with 1 gal. tank, ready to hook up. Jet has built-in, spring-loaded check valve.



DUAL PURPOSE, BOLT-ON JET can be released and installed in well if water drops below shallow well depth. Pumps as double pipe jet to 60 feet. Pump on tank, illustrated.

DEEP WELL JETS— Use the Series SL convertible on deep well installations to 130 feet. Capacities to 1650 GPH. One model—three uses—saves inventory costs, assures better service and efficiency.

VERSATILE
VERSATILE
VERSATILE

STA-RITE

First with the modern innovations and designs that assure value at every price

For 25 years, STA-RITE has pioneered jet pump design and production. Time and again STA-RITE has introduced new engineering developments to make jet pumps better. And time and again, STA-RITE has topped these developments — improved them to make better, more profitable pumps for you.

Now, these new "Silver Anniversary" Convertible Jet pumps keep you in the jet pump business—the big volume, profitable business. Everything you need in jet pumps in this newest, best-of-all STA-RITE jet pumps.

Ask for complete information, specifications, prices. See your wholesaler, or write:

STA-RITE PRODUCTS, INC. • DELAVAN, WISCONSIN

CHAMBLEE, GA. • LOS ANGELES, CALIF. • DAYTON, OHIO • MIAMI, FLA. • SHERMAN, TEXAS
WOODBURY, NEW JERSEY

IN CANADA: STA-RITE PUMPS (CANADA), LTD., AJAX, ONTARIO

Methods of Dressing Cable Tool Bits

WHEN bits are run into a hole the outer wearing surfaces become worn away with continued use. They rub on the inside walls of the pipe during driving procedure, and they rub on the walls of the open hole below the pipe, eventually wearing out of gauge. Bits wear more rapidly in abrasive formations than in soft, non-abrasive materials. When wearing surfaces of a bit end wear down they must be heated, upset by hammer to forge out to proper gauge, reheated and hardened. This can be done in several different ways, depending largely upon individual preference and available equipment. But they are all alike in one respect: the bit must be heated and heated properly.

Use One Method

The methods which follow may not be the only ones and they may not be absolutely the best ones to use. But they are at least as good as any. If you are having uniformly good results with what you are doing, don't change. On the other hand, if you are having trouble, or if in the future you should encounter trouble, the recommendations which follow should help you. A very important point to bear in mind is that, generally, two systems do not mix. Use one or the other, don't compromise.

The steel from which standard cable tool drill bits are made is practically a carbon tool steel. Its development through many years has been on a trial and error basis, until finally the composition in general use today was reached. It is pretty much the same with all producers and bit makers. The main differences are in the closeness in which composition ranges are held and in specifications for soundness and surface conditions.

Take Precautions

Drill bits require particular care in heating for forging and in heating for hardening or, as it is sometimes called, "tempering." Cold bits require some preliminary heating; no bit should be thrust into the hot forge while it is stone cold. If an oil or gas-fired furnace is used, the dressed end of the bit should be placed on the edge of the furnace opening, just far enough in to be supported. As it absorbs heat, the bit end may be pushed progressively farther into the furnace until it becomes hot enough to sizzle when sprinkled with water.

Several recent reader requests for the latest information on bit dressing has prompted us to publish this article. It is based on material taken from "Water Well Drilling with Cable Tools" by Raymond W. Gordon and is an up-to-date version of a similar article which appeared in the November and December 1953 issues of THE DRILLER. Copies of Mr. Gordon's book are available at a cost of $2.50 from Bucyrus-Erie Co., Sales Promotion Department, South Milwaukee, Wis.

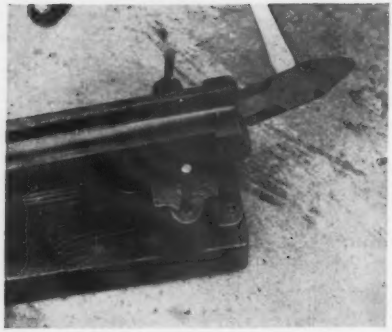


Fig. 1. Bit dressing: step one.

Then there will not be any danger of cracking in further heating. If a forge with solid fuel is used, the dressed end of the bit should be placed near the fire, but not in it, while it warms up slowly. Bit steel will sizzle at 300° F. By the time it has reached 700° F. there will be no danger of cracking.

After preheating in an oil or gas-fired furnace, the temperature of the back wall, opposite the opening where the bit is admitted, should not exceed 2250° F. Without a pyrometer, this temperature is difficult to determine, so the rate of heating may be used as a guide. A 6-in. bit requires about 30 minutes to reach forging temperature and a 10-in. bit requires about 45 minutes. If bits are heated in less time, the furnace should be adjusted. The same rate applies to forge heating. The maximum temperature to which bits should be heated is about 2100° F. While 2100° is satisfactory for bits used in drilling formations which are no harder than soft limestone, 2000° or even 1950° F. is a better temperature for bits which are to be used in hard rocks, such as granite and pigmatite.

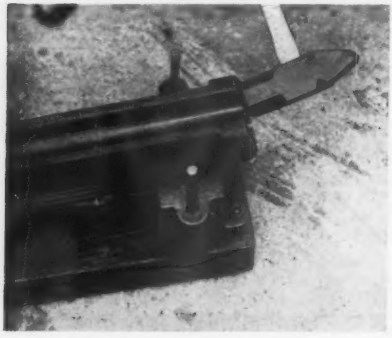


Fig. 2. Bit dressing: step two.

Light conditions in the open make it virtually impossible to detect proper temperatures with the naked eye. Direct sunlight on bright days, or lack of it on cloudy dull days and during early evening hours, causes wide variation in the estimate of heat given to the bit when only the eye is used to judge temperatures. Some provision should therefore be made to furnish as closely as possible the same light conditions for each heating. When open forges are used, a canopy should be built over the bit fire.

Fig. 3. Bit dressing: step three.

During the heating process, a bit should be turned frequently and its drilling end heated evenly on top, bottom and sides. It should extend into the fire just far enough so that only about five inches of the stock

Fig. 4. Bit dressing: step four.

will be brought to forging temperature in the prescribed heating time.

The type of fire is extremely important. Direct contact of the flame in the oil or gas-fired furnace should be avoided, and direct air blast against the bit in the forge must not be permitted. In oil-fired furnaces, the mixture of fuel and air should be regulated to give off a slight smoky appearance. There should be a slight excess of fuel to air to produce a rich mixture, otherwise a sharp, too hot flame will heat the outer edges of the bit faster than the inside. This will result in burning the corners of the bit and in setting up internal stresses which will tend to crack the bit when it is forged. There should be as little scaling as possible, for scaling causes decarburization. Decarburized surfaces will not harden properly and therefore bits which have been "burned" will not drill expected footages. Decarburization should not exceed 1/100 of an inch and must never exceed 1/64 of an inch.

If a forge is used, the rate of heating should be the same as with oil or gas. The fire pot should have a diameter of 16 to 18 inches for heating 6 or 8-in. bits. Larger bits require proportionately larger firing areas. It is essential that the bed of the fire be deep enough so no air blast from the blower will come in direct contact with the bit. For 6 or 8-in. bits, the fire bed should be at least 12 inches deep, free from clinkers or slag and the fuel should be clean. For best results, coke or a good grade of soft coal should be used. An arch or hood should be provided if at all possible. When oil or gas is used as a fuel, the closer the fire resembles a forge fire the better. The furnace should be constructed to provide a combustion which will not contact the bit but which will offer a rolling, turbulent constant blanket of uniform fire around the bit.

Control Air Blast

Some operators construct portable forges from steel barrels lined with fire brick. Others build almost permanent forges from brick and fire clay. Still others, because the drilling of the average water well requires relatively little time, simply dig a hole in the ground, line it with clay and use a 4 or 5-ft. section of 3-in. pipe as a tuyere iron to connect to the air hose from the blower. The air blast from

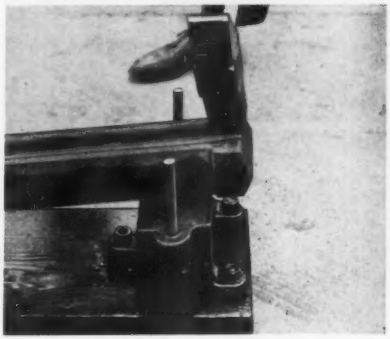


Fig. 5. Bit dressing: step five.

the blower may be controlled by tying a piece of twine or cord around the hose. After the fire has burned for several minutes, less air blast is required to keep a uniform slow heat throughout the forge area. By tying the hose, an operator runs less danger of overheating or rapid outside heating, and the steel will flow under the hammer blows without cracking.

When field forges are used it is common practice to heat the drill bit as drilling continues with a sharpened bit. It should not be necessary to stop drilling operations to heat, dress or harden the average-size bit. In some formations, such as sandstone or highly abrasive granite, an operator will find it convenient to include more than one pair of bits in his tool list, for it is possible that the running bit will become worn out of gauge before the other can be dressed and cooled.

After the bit has been heated to forging temperature, it is transferred from the fire to the anvil block for forging. This should be done as quickly as possible so the steel can be worked while hot.

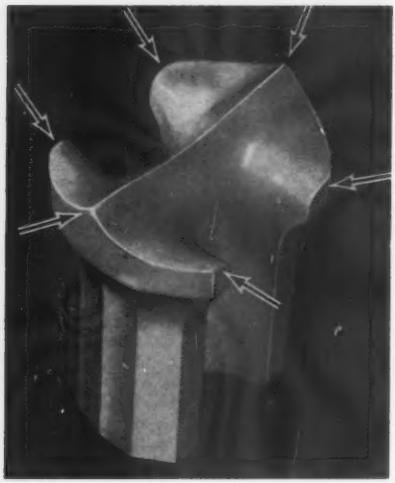


Fig. 6. Points to be brought to full gauge.

With the bit placed on the anvil block, two men take positions slightly forward of the anvil. To bring the bit out to gauge, they strike alternately against the center of the bit, forming the proper contours of the penetrating edge. After one or two blows have been struck, subsequent blows should be delivered progressively toward the outer edges along the center line (Fig. 1). Two or three final blows delivered at the face a little higher up from the center line (Fig. 3) and two or three pulling blows at the corners (Fig. 5) will draw the corners out to gauge.

Improper Positions

If the men stand too far forward to deliver blows against the face, the angle of penetration (Fig. 7) will be blunt to almost straight. But if they stand too far back, the penetrating angle will be too sharp. Each man should attempt to strike the bit with equal force to avoid developing crooked or off-side faces.

With one side upset, the bit is turned over to permit the same treatment on its opposite face. By now it should be just slightly larger than gauge. For a 6-in. bit worn to permissible undergauge limits, only about six or eight hammer blows, well delivered on each face, will be needed to bring the face edges out to full gauge.

The bit is then turned upon its side. While one man holds it in position, the tool dresser forms the angle of clearance and wearing surfaces, first on one side and then on the other, to bring the final circumference to gauge. Care should be taken to bring six im-

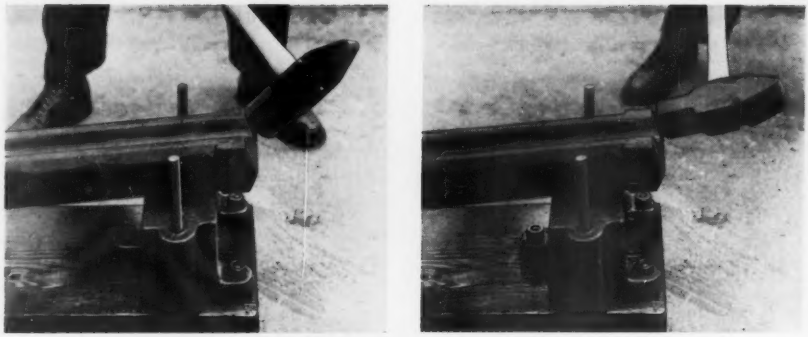


Fig. 7. Improper positions: In picture at left, the hammer is being swung from a position too far forward. In picture at right, from too far back.

portant points of the bit to full gauge —the four corners and the two opposite points of the center line of the penetrating edge.

We cannot overemphasize the importance of working the steel while it's hot. Bits worked after they have been allowed to cool are likely to develop internal cracks which later may wrongly be attributed to poor steel or improper hardening practices. Rather than abuse both steel and machine or men by working cold steel, reheat the bit. A 6-in. bit properly heated in the first place can be dressed

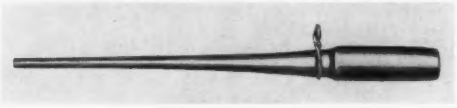


Fig. 8. Bit ram.

by two fast working men in about five minutes with no need for reheating.

When dressed to proper size and shape, a bit is set aside to cool completely black before reheating for hardening. Before the bit is put in, the fire in the forge or furnace must be brought back to proper size and temperature. A 6-in. bit will be raised to the desired temperature in 15 or 20 minutes. Only the end and about three inches up the stock (measured from the points of the bit) should be heated—heated thoroughly on all sides and through this section. Slow, uniform heating in the fire with frequent turning of the bit will accomplish this.

When the temperature of the bit has risen to the point at which it loses its magnetism, the bit is ready for hardening. The color of the heated end will be a dark cherry red. This non-magnetic stage can be determined by an "Alnico" magnet powerful enough to detect slight amounts of magnetism well below the surface. Ordinary horseshoe magnets are not strong enough to do much good.

As soon as the bit turns a dark cherry red, it is withdrawn from the fire and tested with the magnet. Its entire face and edges should be non-magnetic, but some magnetism should be shown about one or two inches back from the wearing surfaces. If the face or wearing surfaces still retain magnetism, the bit should be heated a little more and tested again with the magnet. Whenever the non-magnetic stage extends back more than two inches from the wearing surfaces, the bit is too hot for quench-

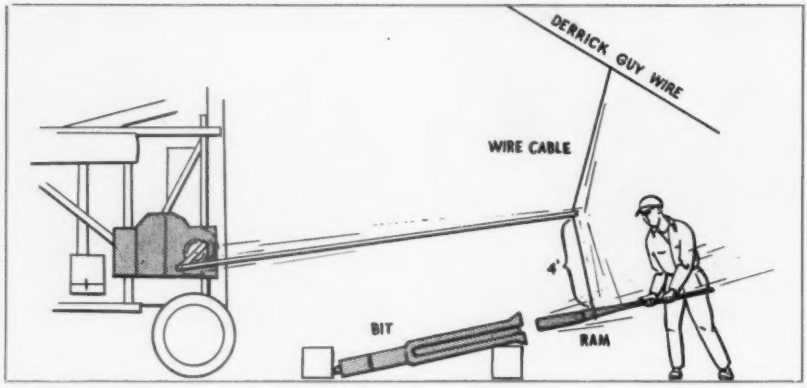


Fig. 9. Motion of the bit ram.

ing and its color will be brighter than dark cherry red. In such cases, the bit should be set aside and allowed to cool before the process is repeated because a quench should always be made on rising heat rather than on diminishing heat. This cooling and reheating is vitally important and will pay dividends in added footage and freedom from cracks. The faster a bit is cooled in quenching, the better the hardening will be.

Tempil Sticks

Another method used by some contractors to determine the proper hardening temperatures is the use of tempil sticks. Two sticks, one for temperatures at 500° and another for 550°, should be purchased. When applied to hot surfaces, the marks from these sticks will pass through four stages of transformation: (1) they change color when applied to the hot steel; (2) they take on a chalky, flaky, crumbly appearance; (3) they melt to give a ready liquid appearance; and (4) they burn off in smoke.

Quenching follows different procedures with the two methods. In the first instance (magnetic method), the bit is immersed as quickly as possible in water to a minimum of seven inches. Greater immersion depth is permissible and all stock heated to redness should be well under water. The bit should not be removed from the quenching tank until it is cool to hand touch.

In the latter case (tempil stick), the bit is placed upright in a quenching tub arranged to allow water to cover the cutting edges only. After about five minutes, depending upon the length of heat and size of bubbles, the bit is removed from the quench to allow the color to run. At this stage, bubbles in the water courses are still finger size, while those surrounding the outside of the bit are much smaller.

The 500° and 550° sticks are applied on the outside and center respectively so that transformation can be observed. Both outside and center marks should react in the same way. To produce the same transformation, the operator may control heat by sprinkling water over the hottest surfaces. As soon as the 500° mark begins to smoke, and just before the 550° mark has reached the smoking

or greasy stage, the bit is plunged into the quenching tub.

Turning now to water required in the quenching tub for immersing the bit, we want to point out that some very good operators get excellent results by shallow quench. They maintain the water line about one inch above the corners and leave the bit in the quench until cool to hand touch.

However, when bits are treated in the shallow quench manner, the face of the bit shrinks at once, while the stock immediately above is still red and therefore plastic and yields without trouble to the shrinkage of the face. But as the portion of heated steel above the water line cools, it also must shrink, while the part under water has permanently set and resists the shrinkage of the upper portion. This results in contracting stresses locked up between the two portions and cracking often occurs.

Molecular Change

The reasons for the various steps recommended for heating, hardening and quenching can be explained clearly. When steel is heated through the magnetic and into the non-magnetic range, significant changes take place. The original grain structure is practically erased and a new, very fine structure takes its place. This fine, silky-grain structure is relatively tough and shock resisting. But continued heating causes grain growth, so that a bit quenched from the dressing heat will be coarse grained and brittle. It should be remembered that the grain changes only on heating, never on cooling.

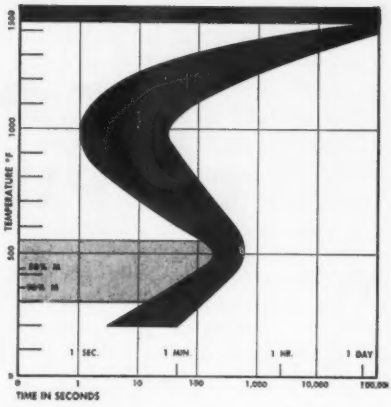


Fig. 10. Bit dressing time and temperatures.

That is why steel should be quenched as soon as possible after the change takes place, thereby preserving its fine, tough structure. The carbon in steel at ordinary temperatures is in the form of carbides. When steel is heated to the non-magnetic condition, these carbides go into solution, somewhat as sugar dissolves in hot coffee.

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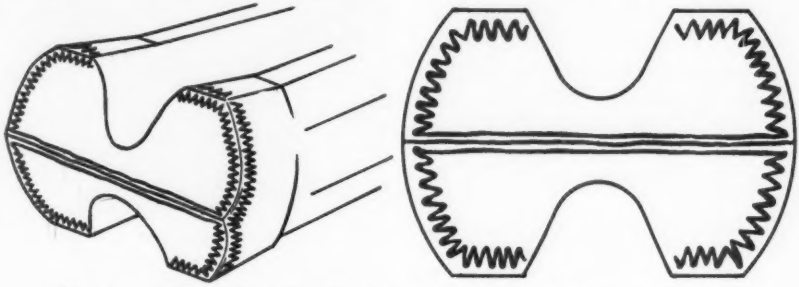


Fig. 11. Areas to be hard surfaced (side view, left, and end view, right).

When customers are hard pressed to pay cash for wells, Indianapolis Contractor Allen Matlock has learned . . .

IT PAYS TO FINANCE!

WITH his well drilling business showing a decided lag in 1958 after two relatively good years in 1956-57, Allen Matlock of Matlock Well Drilling Co., Indianapolis, Ind., was quick to take stock of the situation. The countrywide industrial recession had affected the general economy of Indianapolis to the extent that many new home owners and potential home owners — Matlock's primary market for water wells and pumps — were feeling the pinch on their pocketbooks. They usually had enough to build, but as a rule there was little left over to cover the cost of putting in wells and water systems. People who needed repairs or wanted wells cleaned out were inclined to wait until the economic picture showed some promise of improvement.

But Matlock found a simple solution—a finance system. This certainly was nothing new in the business world and was by no means unfamiliar to the short, stockily-built well contractor. He had used it successfully in financing installation of pumps, an arrangement first set up through Goulds Pumps, Inc., for whom Matlock serves as local outlet.

"Say a customer comes in and wants a complete water supply system, in-

Tools of 20-W are hoisted out of hole just prior to driving final section of casing on a 4-in. diameter home well near Beech Grove. The driller is Roy Matlock.

cluding well, pump, plumbing, etc," Matlock explained. "If he doesn't have the ready cash, we contact a financing firm in Cincinnati, Ohio, and a deal is worked, where the credit rating is good, calling for 10% down and the balance spread over two or three years. He pays it like a water bill, in small, convenient amounts. Since we've had this program, we've contracted practically half of our business that way. From all indications, I believe this year may be the best we've ever had, thanks to the financing."

Matlock and the Goulds people had originally set up the finance system because they found people could go to a large national retail store, for example, and buy pumps for $5 down and $5 monthly. They had to do something to counteract such competitive bargaining.

Good Reputation

But financing isn't the only secret of Matlock's success in Marion County and the five other counties he covers that fall within a 50-mile radius of Indianapolis. "I'd say the reputation I've built up throughout the territory is the main reason I continue to get more than my share of the well and pump work, despite lots of competition," Matlock stated. If you do good, quality work, one man will tell another. People nowadays are kind of skeptical when they look for well drillers. They recognize the Matlock name as one of the old, reliable ones in the area."

The Matlock firm got started in 1930 when Allen's father, the late John W. Matlock, operated a homemade rig, drilling 2-in. diameter wells. Allen joined his father in the late 30's and stayed on as summer help until graduating from high school. In 1944 he went to work for another local contractor, Bill Kollman, to gain additional experience. He was with Kollman 30 days, drilling 16 wells to average depths of 65 to 80 feet. Then he bought out Kollman and started operating a 4-in. diameter homemade rig on his own.

In 1947 Matlock purchased a new 240 Star and followed it up with another Star in 1948. In 1949 he sold the first rig and worked just one machine until 1953, at which time he bought a Bucyrus-Erie 20-W, mount-

Roy Matlock bears hard on wrench he uses to tighten section of casing.

ed on a 1942 Chevrolet truck. A year later he increased the number to three, purchasing another 20-W, mounted on a 1½-ton '46 Chevrolet truck. Finally, in 1955, he traded the Star for a third 20-W, this one mounted on a 1946 1½-ton Ford truck.

In addition to the three drills, Matlock currently owns a 1950 Chevrolet pump truck, a 1948 Ford service truck, a 1949 Ford service truck and a 1949 Ford pickup.

Makes Screens

As local dealer for Goulds, Matlock keeps a stock of submersible and jet pumps. He uses single-strand plastic pipe in most of the popular sizes—¾, 1, 1¼ and 1½-in. diameters. With jet pumps, a ¾-in. size is generally used. He makes his own screens to fit his needs.

The Matlock firm also dresses its own bits by taking them to a local blacksmith where they are heated to forging temperature and then hammered to gauge by Matlock crews. A Forney electric welder and acetylene equipment are included on the pump truck for cutting pipe casing.

In covering a six-county territory, Matlock runs into many different ground formations. Layers of mud and hardpan vary considerably, with the latter situated anywhere from a trace right near the surface to depths of 120 feet.

In Marion county, water is generally found in sand and gravel at average depths of 80 to 100 feet. Depths in the surrounding area vary from a minimum 25 feet to a maximum (to date) 720 feet. Matlock's rigs average 150 to 200 feet of hole per week, including the time it takes to complete the entire water system. Approximately 95% of the wells are

now being drilled for suburban homes, most of them for building contractors. The remaining 5% is comprised of farm and industrial wells. Matlock recently finished drilling four wells in a new home development area on Indianapolis' northwest side, making "close to 50 wells" put down in that addition by Matlock, and all but two of the entire number so far drilled there.

When visited by *The Driller,* Matlock and Driller Albert Stroup were just finishing the cleanout of a 4-in. diameter, 135-ft. deep well with one of the 20-Ws. The well had been drilled a month earlier and was sealed pending the owner's decision on the type pump to be installed. Someone, possibly children, had broken the seal and threw sand, mud,

Contractor Allen Matlock checks clarity of water in well being cleaned of sand, mud, gravel and other foreign matter.

gravel and various other objects into the hole.

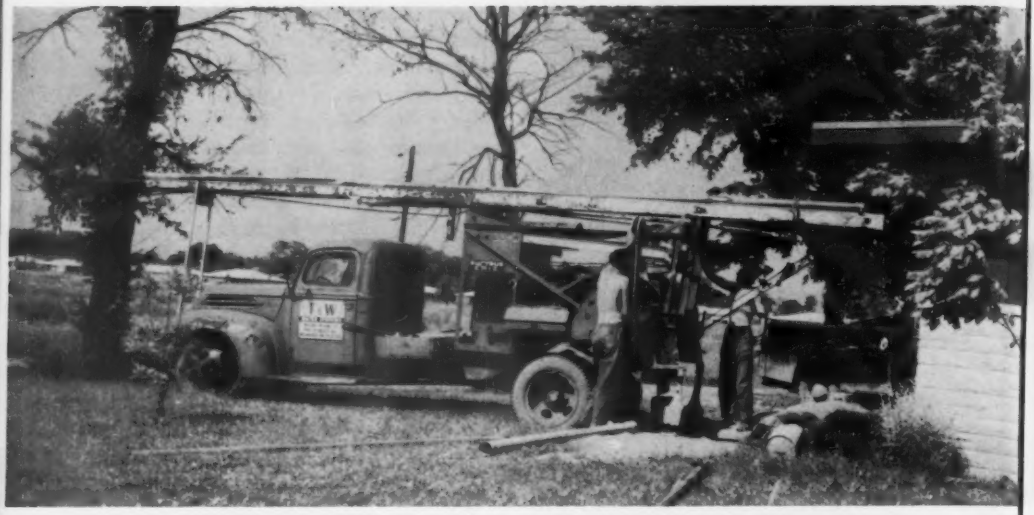
Hoyt Foster, normally the pump installation and service man, and helper J. B. Bell had another 20-W on a domestic well for a tri-level home near 52nd St. and Kessler Blvd. in Indianapolis. The well had been drilled six years ago by Allen. An increasingly heavy iron and chemical content in the water ate through the screen, and sand and gravel began to seep into the water system, plugging toilets, showers and automatic washers and making the water unsuitable for drinking.

Install Pump

Foster and Bell deepened the well to 135 feet, about eight feet into limestone to avoid sand in the pump test. The well tested at 900 gph through 2-in. pipe and showed no trace of sand. They then inserted a 3-ft. Goulds submersible pump to a depth of 63 feet and completed the well.

The internal water system next had to be cleared. Matlock's men agitated the water tank several times and ran

Pipe casing is fastened down by helper before he heads to job site.



J. B. Bell (left) and Hoyt Foster prepare to drill a 4-in. home well in Indianapolis.

Hoyt Foster, Matlock's pump installation and service man, tightens seal on well supplying water to tri-level home.

a hose directly from the tank in an effort to flush out the sand and gravel. The tank was located in an area on the bottom level of the home where it could not be removed and emptied without tearing out some of the foundation. After several hours of "flushing", the system was finally washed clean.

Matlock's brother, Roy, had the third Bucyrus-Erie 20-W on a well for an elaborate suburban home just outside Beech Grove, southeast of Indianapolis. The rig was drilling at a little over 100 feet, and Roy was pounding down a section of 4-in. diameter casing.

In discussing previous well jobs, Allen Matlock revealed he had put down a well in 1951 to provide water for a supplier of dressed chickens to local restaurants. The customer wanted a sufficient quantity, as well as pressure, to clean the chickens and wash out the slaughter area. In less than three days (one day for drilling),

Matlock completed a 6-in., 48-ft. well that produced 75 to 100 gpm with a 15 to 20-ft. drawdown.

Matlock occasionally drills wells for local ice houses. He recalled one in particular which tested to 100 gpm. The ice house already had one well, but its output suddenly dropped to a point that threatened to shut down operations. "We had to rush our rig in and get them more water to keep the coils cold," Matlock explained. An 8-in. well was drilled to a shallow depth of 50 feet, and a homemade 5-in. x 10-ft. (No. 8 brass pipe) screen was inserted.

Deepest Well

On a domestic well southwest of Morrisville, Matlock put down his deepest well. It was a 4-in. well that "just wouldn't produce a sufficient supply, although we hit several water-bearing formations. We finally finished at 720 feet in blue slate rock but still didn't get too much water. I never could figure out why."

While Matlock himself couldn't think of any really tough problems he had faced, Hoyt Foster, who came out of the Marines five years ago to drill for Matlock, recalled one experience he had on a Matlock well.

"Last November we were drilling a 4-in. residential well just north of Indianapolis. At 309 feet we decided to pull back to a smaller run of bedded sand and gravel because silt and mud kept seeping into the hole. That's when it happened!

"We were trying to pull out the casing when the cable broke just above the string, and the tools fell 309 feet. The casing spear drove plumb into the lime. We tried for three or four days to get the tools out but just couldn't do it. So we ran a

(Continued on page 73)

Matlock (left) discusses pump inventory with Goulds' representative O'Gorman M. Browne. At desk is Matlock's sister-in-law, Alma, who acts as his office manager.

Spare Time Driller

Here's a contractor who averages 150 wells a year during the hours off his regular job as a fireman. And he does it with a Bucyrus-Erie 22-W.

by GEORGE W. PHINNEY

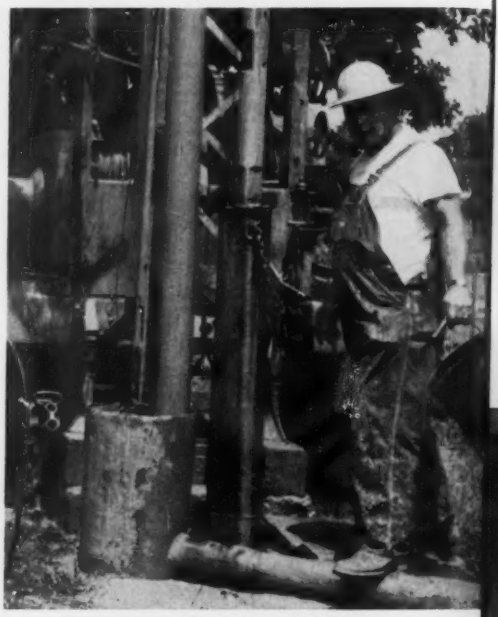
AN average 150 water wells drilled in his spare time each year may sound like a grossly exaggerated statement to anyone not familiar with the working habits of Homer H. Harwell, Midwest City, Okla. But anyone acquainted with Harwell knows this is only a natural accomplishment for him.

Harwell is a big, middle age man—strong, active and full of nervous energy. When he started work as a fireman at nearby Tinker Air Force Base nearly 13 years ago, the three 24-hour shifts per week left him with so much extra time that he didn't know what to do. He tried to occupy this time by gardening and fixing up his acreage, among other things. But nothing seemed to satisfy him.

Tries Drilling

After a time Harwell decided to go back to his old profession of drilling water wells on the days off his regular job. He soon found that drilling still fascinated him and that each new job presented a challenge.

To get started, Harwell bought an old secondhand wooden rig. The machine was in bad need of repair and gave him a lot of trouble. The more wells he drilled with it, the greater were his costs. Frequently there was no profit at all. For a while he was tempted to give up the venture, but then orders started coming in more regularly. Midwest City and nearby Tinker area acreages were being improved at a terrific pace, and dozens of plots surrounding Harwell's own suburban home needed water wells for development purposes.



Homer Harwell poses at the business end of his Bucyrus-Erie 22-W. He started out with an old secondhand wooden rig.

Encouraged by his wife, Harwell stubbornly stuck to his spare time drilling. Although often disgusted with daily breakdowns and costly loss of time, he kept repairing, replacing parts and patching the old machine until it was in fair working order.

Eventually he found there was as much or more money to be made as in his regular job.

A little more than two years ago Harwell bought a new Bucyrus-Erie 22-W and retired the old wooden outfit to a back lot. Although he felt this was a big investment for a wage earner like himself, Harwell was determined to have the best. Today, he is more than convinced that he made the right choice in purchasing the Bucyrus-Erie rig. After drilling more than 400 wells in locations from a level frontyard to an almost inaccessible hillside pasture, Harwell has never had a moment's trouble nor has he had to spend one dime for repair.

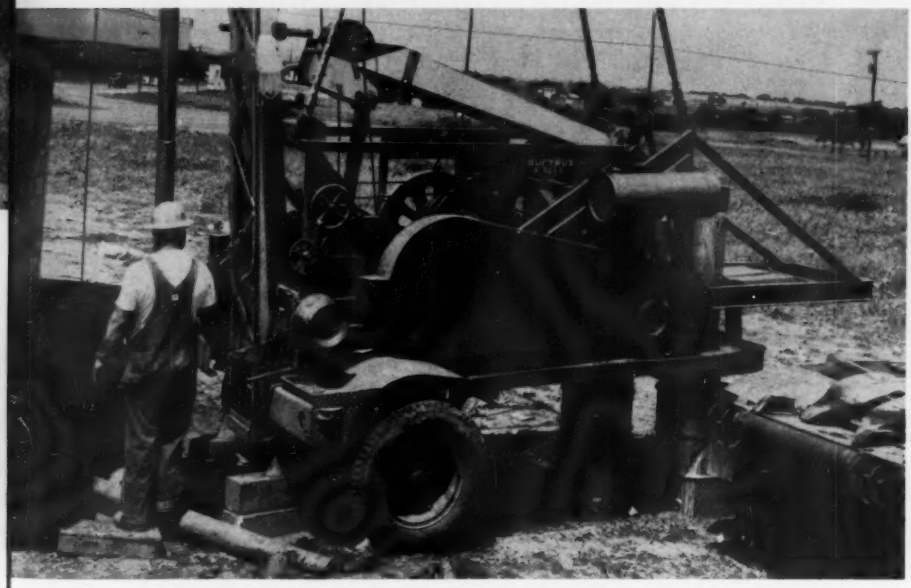
"I wouldn't trade the 22-W for any five makes of drills I ever heard of," said the genial driller proudly. "It's used every other day the year around, is frequently pulled 45 miles to location and, when set up for action, has never yet failed to perform perfectly."

The Hercules engine powering the 22-W is fueled with propane gas. This Harwell found is much cheaper than liquid fuel, causes less engine wear and gives a more even performance.

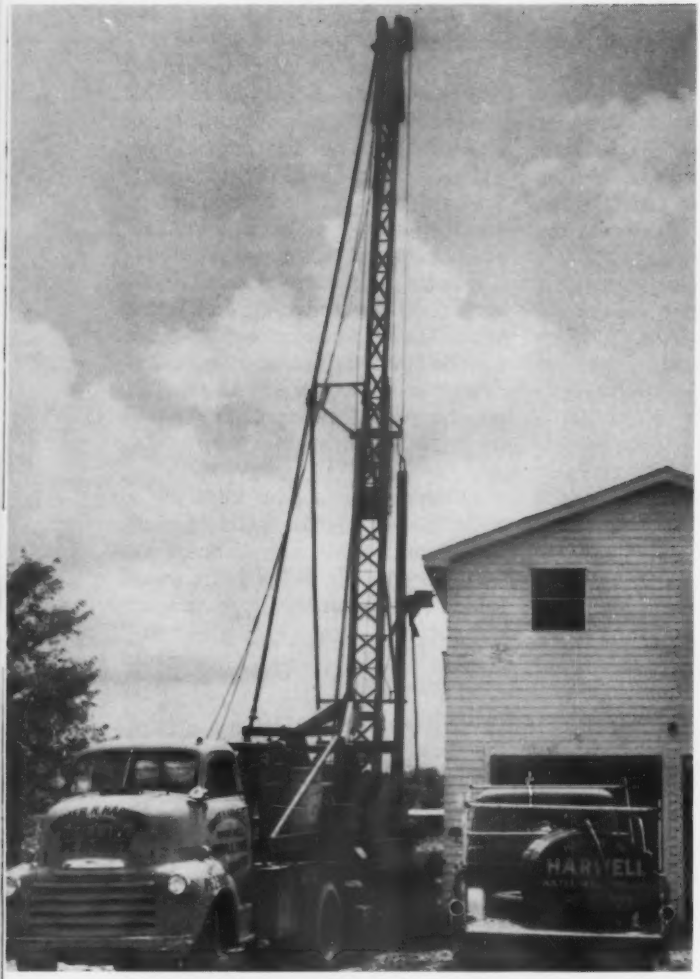
Harwell has his 22-W mounted on a trailer which is pulled by a '52 cab-over Chevrolet ¾-ton truck. The rig is spooled with 1,100 feet of ⅝-in. steel drill line and the same length of 7/16-in. bailer rope. To date, neither line has fouled nor broken, though combined weight of the 6-in. bit and jar is 2,800 pounds.

Smooth Performance

"Performance of the 22-W is so rhythmic and regular," says Harwell, "I can tell within a few inches just how deep a hole is by the sound. I seldom need to check depth measure-



Harwell puts down a 6-in. well for small neighborhood store in suburban Midwest City. The drill is powered by a Hercules engine fueled with propane gas.



Here the 22-W sinks a 6-in. home well. Since water bearing formations are relatively near earth's surface, holes are seldom drilled more than 100 feet deep. Harwell often drills two holes a day. Most of his work (about 95% of it) comes from acreage owners, the rest from small suburban business area developers and farmers.

ment until I get within a few feet of bottom."

In the years Harwell has been spare time drilling, he has extended his territory from a few blocks within his own home to a radius of 45 miles around Midwest City, an Oklahoma City, Okla., suburb. About 95% of Harwell's business comes from acreage owners, the other 5% from small surburban business area developers and farmers. His charge of $1.00 per drilling foot is standard rate in the Midwest City-Oklahoma City area.

Instead of a tapering hole, Harwell has found that a 6-in. diameter bore all the way down is the most practical for the type of wells needed to supply water for the average home in his drilling territory. Although he will use whatever kind of casing a customer desires, his choice for the wells he drills is 5½-in. plastic pipe.

"This type casing," Harwell says, "is a little more expensive, but it lasts long, is fast and easy to put down and never makes the water taste bad, regardless of how long the well goes unused."

Harwell is equipped to put down the well and install the pump and tank, should the customer so desire. And another thing, if the well isn't

(Above) Mrs. Harwell, who takes care of business matters visits job site to discuss future contracts with Homer. (Right) Harwell's pet parrot "Polly" is usually on hand to supervise drilling.

to be used for some time, he welds a lid over the casing to keep youngsters from throwing rocks, sticks and other foreign matter into the hole.

In most areas of his drilling territory, Harwell seldom has to go below 100 feet to get ample water, although in a few instances he has gone to 500-ft. depths. He positively refuses to select an exact water well location for any prospective customer. "If I hit a dry hole," says the jolly driller, "it's not my fault, and the customer has no gripe whatever with me."

Due to the type of ground formations around Midwest City, Harwell can drill 12 to 15 wells before his bits need resharpening. The average job takes only five to eight hours to complete, and it is not unusual to finish two 75-ft. deep holes in a day, depending on the distance between job locations.

Homer Harwell always has a full schedule for his spare time drilling. He leaves the scheduling completely up to Mrs. Harwell. While he's at work as a fireman, she answers the telephone, takes orders, discusses drilling problems, jots down directions to new customer locations and acts as business manager. If she can get away from the house, she drives the pickup truck with miscellaneous supplies when the drill rig is moved from one location to another.

Harwell has several years of well drilling experience behind him. He worked for a time with a Phillips Petroleum Co. seismograph crew after

he got out of the Army following World War II. Prior to the job at Tinker Air Force Base, Harwell did soil testing work on the roadbed of Oklahoma's Turner turnpike, often working with rotary outfits.

If you want to get an argument out of Harwell, just start pointing out the good features of the old-time wooden rigs. He will state emphatically that a Bucyrus-Erie 22-W is the best, easiest to operate, cheapest to maintain and the only really practical outfit in the

(Continued on page 77)

"I know my dealers!"

Fairbanks-Morse Dealers really have the manufacturer behind them. There is an F-M Home Water System specialist who calls on them regularly. He brings to their aid the vast engineering, manufacturing, service and dealer-training resources of the largest company in the home water system business. Dealer problems are thus handled *directly* with Fairbanks-Morse with no intervening or time taking steps between.

Thus Fairbanks-Morse Dealers get more in product service and training. In addition, Fairbanks-Morse advertises its dealers by name and address in their local areas.

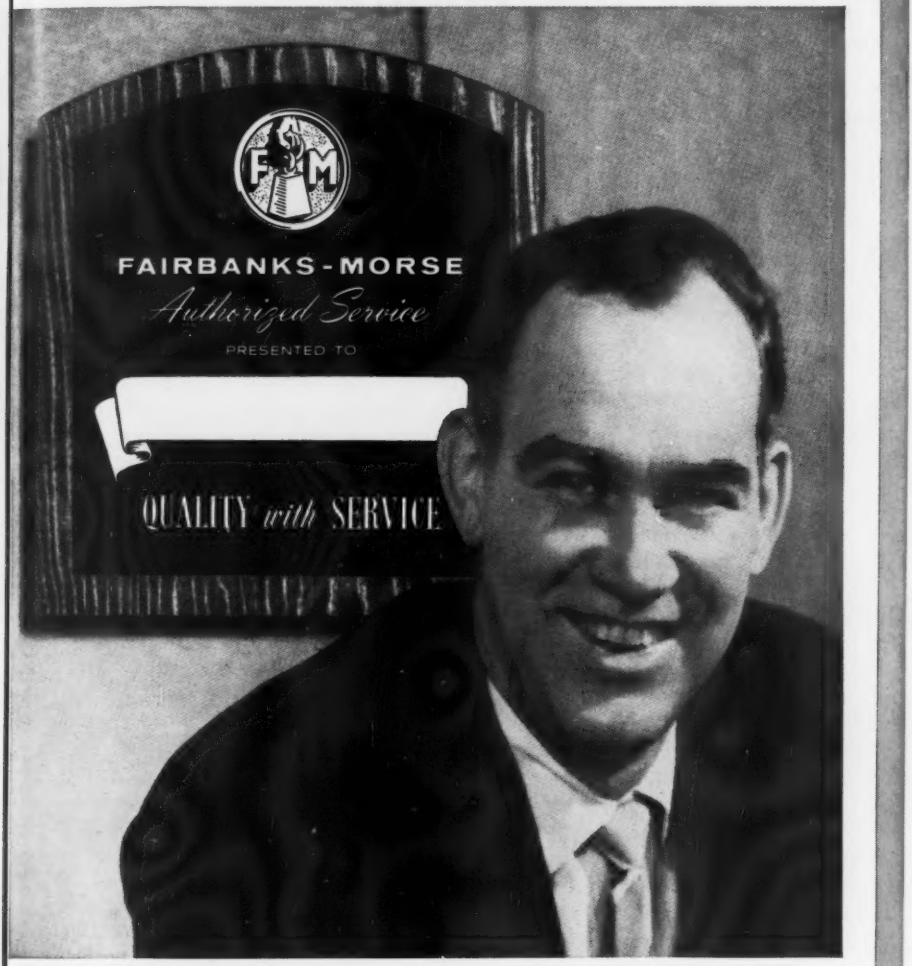
As a water system dealer, why don't you add up the benefits of being an F-M Dealer. Compare and decide. A letter from you will bring the Fairbanks-Morse representative in your area to explain the many advantages of being an F-M Dealer. Write Fairbanks, Morse & Co., 600 South Michigan Avenue, Chicago 5, Illinois.

CERTIFIED PERFORMANCE

FAIRBANKS-MORSE

a name worth remembering when you want the BEST

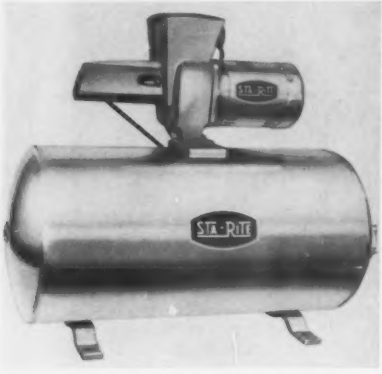
HOME WATER SYSTEMS • PUMPS • SCALES • GENERATORS • ELECTRIC MOTORS • COMPRESSORS
DIESEL, DUAL FUEL AND GAS ENGINES • LOCOMOTIVES • MAGNETOS



The F-M System Representative. The average F-M representative is 39 years old. He has been with the company 10½ years. He has served dealers for 8 years and sees each of them frequently. He knows water systems!

News of the month

New Convertible Jet Pumps Announced by Sta-Rite



A new line of convertible jet pumps called the SL series has been announced by Sta-Rite Products, Inc., Delavan, Wis.

Featuring newly designed impellers made of General Electric Company's Lexan—a new plastic—the convertible pumps assure greater customer satisfaction and simpler installation than has been before possible, according to the firm.

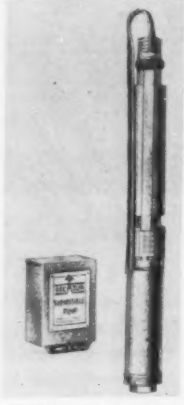
Sta-Rite claims it is the first pump company to use Lexan plastic in jet pumps. This plastic reportedly has properties of durability and strength, especially useful in pump components. It is not supposed to absorb water or swell, is tasteless, odorless, heat resistant to 280°F. and provides smooth water passage surfaces that are resistant to sand abrasion.

The new Sta-Rite jet pumps are permanently self-priming, engineered to hold prime even on slow recovery wells, gaseous wells, and deep well installations, under all normal conditions. Moreover, these new pumps will pick up prime even when water level drops below the foot valve, after water level is restored, say Sta-Rite officials.

The new SL series of convertibles are available in ⅓ through 1½ hp models. They are easily convertible if well water tables drop. The bolt-on jet, which is equipped with a built-in check valve, adapts to double pipe operation to 60 feet. The same pump may be installed on regular deep wells to 130 feet, using regular double pipe jets. The motors on the Sta-Rite jet pumps are of the full, heavy-duty ball bearing type, with stainless steel shaft and built-in overload protection.

For more information, write Sta-Rite Products, Inc., Dept. TD, Delavan, Wis.

Deep Well Submersible Marketed by Decatur



Latest addition to the Decatur Pump Co. line is the Series S Submersible Deep Well Pump, designed for depths to 800 feet with capacities up to 1,320 gph.

The new Series S is available with all bronze pumping parts in the ⅓-hp and larger models. It is also available with polystyrene impellers and bronze diffusers in the ⅓ through 1½-hp models.

Features of the New Series S include a bronze, positive-action check valve, stainless steel pump jacket and motor case, full-length impeller-shaft key, independent waterproof lead wires, water lubricated motor bearing, hermetically sealed motor windings and stainless steel intake screen.

For complete information on Decatur Series S Submersible Pumps write for Bulletin 598, Decatur Pump Co., Dept. TD, 2750 Nelson Park Rd., Decatur, Ill.

Fairbanks-Morse To Expand Research, Development Activities

Expansion of its research and development activities has been announced by Fairbanks, Morse & Co. A central research and development laboratory will be set up in a modern 20,000-ft. square building at the Fairbanks-Morse works in Beloit, Wis.

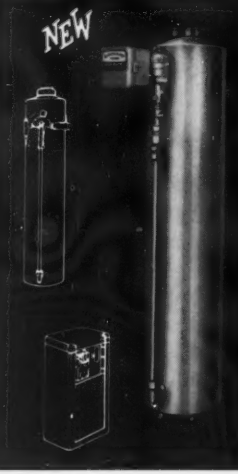
Plans include basic research on electronic weighing and control systems, electromechanical devices and machinery and pumping systems with their related products. This latter group is to include domestic and farm water systems as well as pumps for industrial applications.

The expansion project is to be in full operation by October 1. It will be staffed at the outset by 25 engineers and scientists, chiefly from within the company, who are specialists in their various product lines.

The new research laboratory will operate independently of all manufacturing activities and will be devoted entirely to research and development for all of the corporation's product

(Continued on page 51)

THE *Radiant* LINE OF
WATER CONDITIONERS



Solves all water problems

FILTERS
for Homes and Industrial Plants
- Iron Filters
- Acid Neutralizers
- Water Purifiers
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Available in Automatic Models—requires no customer attention, as well as Manual models,

HYPER CHLORINATORS
for Chlorination, Algae Treatment, Poultry Medication, and many other uses
Precision built, completely encased, easily installed

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RADIANT
UTILITIES CORP.
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from the MAILBAG

This page is open to any of our readers having questions to ask relating to drilling, driving pipe, dressing bits, etc. All letters will be answered promptly by experienced drillers and engineers, who are qualified to give intelligent advice on these subjects. We will publish as many letters of general interest as space will permit. Address: The Driller, South Milwaukee, Wis.

Dear Sir:

We are experiencing abrasion problems in our vertical turbine pumps, caused by fine sand (48 to 65 mesh) carried with the water pumped from our newly drilled wells.

The maximum capacity of one well is 165 to 175 gpm. The solids content of the water is not definitely established, but it is estimated to be 0.5 to 1.5%.

The wells are cased with 8-in. ID casing, with perforated casing extending from the bottom of the bore upward 65 to 75 feet. Depth of the wells vary from 275 to 375 feet. Casing perforations are ⅛ to 3/16 inch wide and 6 inches long and run with the long dimension of the casing. The well bore is 12 inches in diameter. The space between the well bore and the casing is packed with gravel (¾-in. maximum particle size) from the bottom of the bore to ground surface.

We will welcome your suggestions on methods to prevent entry of the fine sands into the pumps.

R.G.L. Wyoming

It appears that you may be attempting to develop these wells in fine sand without a screen or proper gravel pack. As a result, the sand will not only be drawn into the pumping mechanism but in time may even be pumped to a level where its quantity and weight may eventually shut off the water in the well.

Considering the size and construction of the well, it would help some to slow down the pumping rate, thus reducing the amount of fine sand drawn into the pump. However, this would cut the quantity of water pumped and eventually plug the well unless the sand is effectively controlled.

In areas where an extensive bed of fine material—too fine for natural development—is the only source of underground water, a sufficient supply of water can usually be obtained by proper construction of an artificially gravel packed well. This involves the installation of a long screen and the introduction of gravel pack of the proper size and thickness, distributed evenly on all sides.

Unfortunately, in your case, the size of the bore (12 inch)—which has 8-in. perforated pipe—does not present the ideal situation for developing a successful artificially gravel packed well that will still produce a fair supply of water.

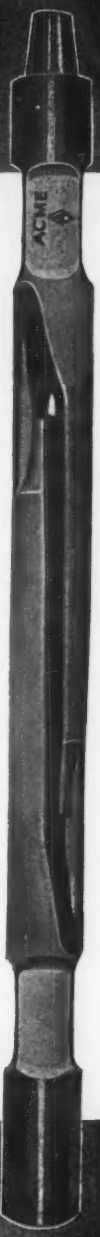
In constructing a well of this type, where there is a fine sand condition, a gravel pack thickness of 3½ to 4 inches is recommended. This would call for a 15 or 16-in. hole.

Analyze Sand

The driller should carefully analyze the sand as the hole is drilled and grade the gravel pack in this manner: If at least 50% of the sand from the well goes through a .0015 slot opening, the maximum size of the gravel pack should be 3/32 to 1/32 inch, and a screen slot opening of .0030 inch should be used. Or, if 50% of the sand goes through a .0030-in. opening, we recommend a gravel pack of 3/16 inch down to 1/16 inch maximum and a .0060-in. screen.

(Continued on page 62)

There is more than meets the eye in...



ACME DRILLING JARS

Carbon or Alloy Steel

You can't see the higher quality steels and the controlled heat treating procedures that help make Acme jars last longer. Nor can you see the experience and integrity that stand behind these Acme products.

But you can see the Acme trademark—the stamp that means these jars have passed many exacting tests of quality control.

Acme offers two types of drilling jars—CARBON STEEL, first choice with many drillers and ALLOY STEEL, for extra footage and longer life.

Both type jars are warranted for a specific amount of wear—NO time limitation on the warranty.

Write Dept. 20 for Tool Catalog

Sold through dealers everywhere

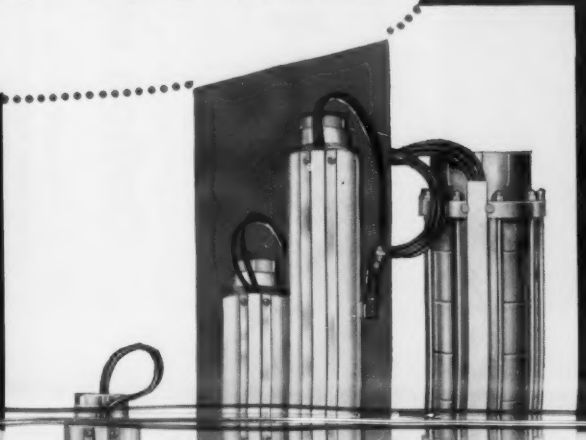
ACME FISHING TOOL CO.
Box 860 — Dept. 20
PARKERSBURG, WEST VIRGINIA

How to get into the booming submersible pump market quickly and how to stay there with the **GREATEST PROFIT**

Rapidayton

HAS ALL THE SUBS YOU NEED

1. World's most competitive 4" models: the 2-wire 3 STAR and 5 STAR—for upgrading jet pump sales and getting into the sub market quickly
2. Complete 4" DOLPHIN® line of 2- and 3-wire models for widest selection and maximum volume and profit
3. 6" DOLPHINS for the highly profitable commercial and industrial jobs



In today's pump market, you need *both* subs and jets. Only from Rapidayton can you get *everything* for proper balance AND greatest profit. The quickest way into the booming submersible market is to sell the Rapidayton 3 STAR and 5 STAR. For maximum volume and profit, follow up with Rapidayton 4" and 6" DOLPHINS. THREE SERIES (not one or two) to choose from! All are competitively priced. See your Rapidayton wholesaler today.

Rapidayton subs are equipped with Tait's own "plus power" oil-filled motors, designed to meet the specific needs of the pump. Exclusive two-piece stator construction permits use of more copper and insulation. Exclusive stage design, incorporating nylon and stainless steel, offers maximum abrasion resistance. Coaxial diffuser system gives 56% more pressure per stage.

Rapidayton
division

The Tait Manufacturing Company, Dayton 1, Ohio
Established 1908 as The Dayton Pump and Manufacturing Co.

©1959 TAIT MFG. CO.

*TRADEMARK

Get fast start in sub market with 3 STAR and 5 STAR. ⅓ h.p. 3 STAR reaches to 90 ft. at full 40 lbs. Retails for **$164.50** with 60 ft. cable

4" Rapidayton DOLPHIN line includes both 2-wire and 3-wire models — a line so broad you need to stock only the pumps that meet your exact needs

For highly profitable big jobs (industry, business, institutions, agriculture) sell the 6" DOLPHINS. 5, 7½, 10, 15 h.p. See your Rapidayton wholesaler

the driller and the LAW

Articles appearing under this heading are published for their general interest, and to remind readers that it is not safe to overlook the legal aspects of a water well drilling business. The articles are not intended to take the place of specific advice of counsel. For such advice, readers are urged to consult a local attorney.

Employee's Safety Devices

New Mexico, and probably some other states, have a workmen's compensation law to the effect that for injury resulting from an employer's negligent failure to supply such reasonable safety devices as are in "general use" for the protection of workmen, a 50% increase in compensation is allowable. The law also provides that compensation benefits shall be reduced 50% if injuries result from the employee's failure to use a safety device provided by the employer.

A water well was being drilled for a city in New Mexico. The contractor was present and directing the work. The claimant was working as a "rough-neck". When the well had been drilled 2,500 feet deep, a cave-in occurred that required a "fishing job" to recover the drilling tools. In the fishing operation it was necessary to turn the pipe. This was done by means of torque applied to a rope extending from tongs being operated by the claimant. As the drilling foreman was applying pressure to twist the pipe, the rope broke, causing the tongs to backlash. On the rebound, the tongs, weighing 175 pounds, struck the claimant's left knee.

"I'm sorry, but if I gave a price discount to every chisler that wanted one, I'd be bankrupt in a month. I hope you understand, Pop!"

Employer Negligent

On hearing of the claimant's application of workmen's compensation award, it was proved that in such circumstances a 5/8-in. cable, with one end clamped to tongs and the other attached to derrick, was a device generally used in the water well drilling industry for the protection of workmen. No such cable was provided by the employer.

The employer and his insurance company argued unsuccessfully that the employer had furnished a chain that would have served the same purpose and that the claimant's injury was due to his own failure to use it. The New Mexico Supreme Court held that the statutory language "in general use," eliminated the possibility of substituting other devices and that the claimant was entitled to a 50% increase of the award allowable to him on the ground that the injury was due to the employer's failure to supply a safety device in general use in the industry. (Hamilton v. Doty, 65 NM 270, 335 Pac. 2d 1067, 1959).

A. L. H. Street

Wire Ropes may look alike... but it's performance that counts

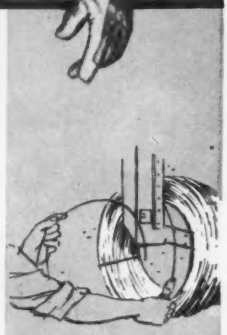
The Image of CF&I stands for the top performance records of all CF&I steel products.

For instance, in the case of Wickwire Rope, a number of quality factors lead to its outstanding performance. These factors are "built-in" the rope through many quality controls and tests, like this one:

Both-Ends Physical Tests

Samples are cut from both ends of every coil of wire and given complete physical tests—for tensile strength, roundness, torsion and uniformity of diameter. Coils that fail any test are rejected for such critical applications as wire rope.

We have recently printed several folders that discuss many more Wickwire control and testing procedures, plus wire rope recommendations for specific equipment. To get a copy, contact the nearest CF&I sales office—but please *state your industry or type of equipment.*



Both-ends testing of wire ensures safety and top performance in CF&I-Wickwire Rope.

6958-A

WICKWIRE ROPE

THE COLORADO FUEL AND IRON CORPORATION

In the West: **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Farmington (N. M.) • Fort Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Odessa (Tex.) • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Tulsa • Wichita

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LOW PRICE

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- Shallow-well
- High Pressure
- High Capacity

ORDER FROM YOUR JOBBER TODAY!

The **DEMING** Co.

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News . . .

(Continued from page 43)

divisions. Initial projects include improvement of existing products, development of new products and exploration of entirely new fields.

The Fairbanks-Morse hydraulic engineering section now located at Kansas City, Kan., will be affiliated with the new central research unit but will remain at Kansas City due to the large pump testing facilities already established there.

Pump Shipping Carton Offers Four Displays

A new shipping carton for Olympian Ejecto pumps, manufactured by F. E. Myers & Bro. Co., Ashland, Ohio, is a self-contained display unit that offers four different types of display possibilities.

A dealer can set up a display without removing the pump from the carton merely by following instructions imprinted on the top of the carton, according to the Ashland firm. The carton is scored and slotted to give the dealer proper guidance in putting the display together.

The carton has a white inner liner and is lithographed in two colors. Even the inner liner in the carton can be utilized in the display. It is scored to be folded and used as a base for the display.

Meyers' pump shipping-display carton.

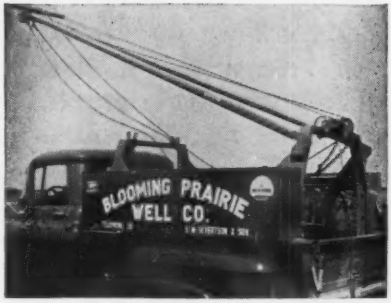
Myers also is using the inner liner in the carton as a display base for its Olympian pump-tank units.

For further information write F. E. Myers & Bro. Co., Dept. TD, Ashland, Ohio.

Orangeburg Issues First 20-Year Guaranty Bond

A Connecticut home builder has become recipient of the first 20-year guaranty bond issued to a home owner by the Orangeburg Mfg. Co., insuring the performance of its SP plastic pipe in cold water service lines.

The bond, presented to Roland F. Stephenson, Burlington, Conn., guar-



VON RUDEN **Hydra-Flex**
PORTABLE DERRICK

Hydra-Flex Hydraulic Motor drives heavy-duty, clutch-equipped 3 ton winch with hydraulic-smooth engagement and release. Pull varies with boom angle . . . ton and a half at 60 degree boom elevation. Boom easily raised or lowered for inside tower or inside building work, hydraulically handled for transport or any boom position.

Write for complete information
Distributor Inquiries Invited
HYDRA-FLEX, INC. CLAREMONT 1, MINNESOTA

"It's easy to sell!"

. . . that's what dealers are saying about this household water filter

Yes, the Aqua-Pure Water Filter is easy to sell because every home needs one even if the water usually *looks* crystal-clear . . . and, at $28.50, every homeowner can afford one. Just talk Aqua-Pure benefits and you've made a sale: it filters out the microscopic dirt, rust, sand, and algae that often enter the "cleanest" system . . . makes washes cleaner, cleaning easier . . . eliminates most causes of staining, cuts corrosion of kitchen and bathroom facilities . . . adds life to pipes and appliances, boosts efficiency of water-treating devices already installed.

For easy sales, for profitable sales, display the

AQUA-PURE®

WATER FILTER

Pats. Pending

SELLS FOR $28.50

WITH EXTRA CARTRIDGE

To help you sell...

National advertising in these and other consumer magazines reaching millions of homeowners interested in cleaner water . . . plus . . . free sales aids you can effectively use in your own promotion.

TODAY . . . SEND FOR COMPLETE CUNO INFORMATION

THE CUNO ENGINEERING CORP., MERIDEN, CONN.

In Canada: Peacock Bros. Ltd., P.O. Box 1040, Montreal 3, P.Q.

THE CUNO ENGINEERING CORP.
Dept. D9, Meriden, Conn.
Send me complete information on AQUA-PURE

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COMPANY _____

ST. & NO. _____

CITY _____ ZONE _____

STATE _____

Please Check ☐ Dealer ☐ Wholesaler

antees in an amount covered by the bond that any repairs or replacements, including labor, due to failure of the pipe, will be made at the expense of Orangeburg. The bond is backed by a national surety company.

Approximately 200 ft. of the pipe was used as drop piping in a jet well and to transport potable water into the residence via an underground service line.

An exceptionally high molecular weight resin in Orangeburg SP plastic pipe gives it complete freedom from slitting or pin-holing, according to the company. This resin, coupled with quality control, has prompted Orangeburg to guarantee the performance of the pipe, which is produced in ½ to 2-in. sizes.

Dewatering Well Point Developed By Johnson

A new self-jetting dewatering well point that will penetrate semi-consolidated material, such as clay and hardpan, and a light-weight, quick-connecting swing joint system have been developed by Edward E. Johnson, Inc., St. Paul, Minn.

The new Johnson "Green Head" dewatering well point is an all-welded continuous V slot well screen. It has a special internal drop tube and a sleeve valve that provide a more positive jetting action than before possible with conventional self-jetting dewatering points, according to the firm.

During the jetting operation, the sleeve valve closes off the inlet ports near the bottom of the drop tube and directs more than 90% of the water force through the cutting shoe. When the well point is pumped, a ball check closes off the bottom, and the sleeve

(Continued on page 57)

NEW SUPER SUB!

A 6-inch submersible you'll install with more confidence than any other

What kind of pump would you put in your own well? Men like you—who know pumps—want one that not only does a job but *stays on the job for many years.* Goulds Series UB 6-inch submersible is that kind of a pump . . . and here's why:

Durable. For sheer strength, every part of the UB sub is more than adequately sized. And all parts are corrosion-resistant, too . . . either bronze or stainless steel.

Completely field serviceable. You can take the unit apart and make repairs without any special tools (see cutaway diagram). The easily removable companion flange (1) allows for easy check of pump rotation—you simply insert a screwdriver in the slotted shaft end (2). It's not necessary to remove tie rods (3) to check rotation of the shaft.

Never any need to lubricate. Goulds Series UB subs come equipped with dependable NEMA standard American-made motors. Emulsion-filled and water-lubricated, these motors will continue to operate for the normal service life of the pump . . . so you never have to remove the unit from the well just to refill with a "supply" of special lubricant.

Find out all the details on this tough, new pump by writing for more information. Goulds Pumps, Inc., Dept. DR-99, Seneca Falls, N. Y.

GOULDS GP PUMPS

Which twin is the PHONY?

One casing reel is made by Bucyrus-Erie for a Bucyrus-Erie drill. The other is made by a "will fit" manufacturer for his profit. You can't see the difference, but there are two ways to find out.

They can be compared scientifically with devices that measure dimensions accurately to .001 inch or determine the characteristics of metals. But a more dramatic way is to mount them both in your Bucyrus-Erie drills.

With the "will fit," there'll be trouble before long. This method is sometimes dangerous, usually costly, and never recommended. The other gear and its companion parts will run as if they were made for each other — because they were.

Of course, with Bucyrus-Erie drills, you need not face this problem. Your Bucyrus-Erie distributor carries only genuine B-E parts . . . and Bucyrus-Erie has the most extensive network of distributors in the business. These distributors offer 85 percent off-the-shelf parts service plus a complete line of approved drilling and fishing tools.

So, for your drill's sake, and for the sake of the job, use only Bucyrus-Erie parts supplied by your B-E distributor. Bucyrus-Erie Company, Drill Division, Richmond, Indiana.

BUCYRUS ERIE®

BACKED BY THE BEST IN SERVICE

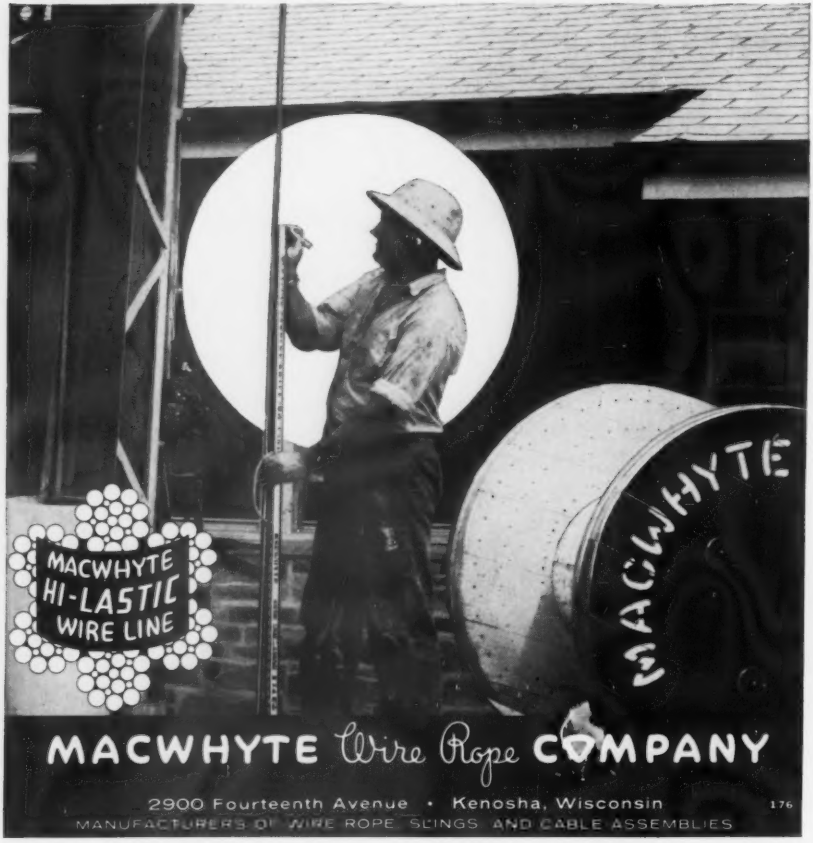
"HI-LASTIC" MEASURES UP!

- **cuts wire line costs**
- **speeds drilling**

Macwhyte "Hi-Lastic" is a super-tough, extra-spring line, originated by Macwhyte, and specially designed for drilling water wells or blast holes to 1000 ft. depth.

"Hi-Lastic" line's unusual elasticity gives more snap — strikes a harder, faster blow with every drop of the tool. Internally lubricated strands resist moisture, corrosion, and internal friction.

Your Macwhyte distributor can supply you with "Hi-Lastic" in ½", 5/8", 9/16", ¾", and 7/8" when you need it! Drilling lines with plastic core are available on special order. Write for your free copy of "How to get more service from your water well lines," Bulletin 5990.



News . . .

(Continued from page 52)

valve opens to permit the soil to be dewatered down to the bottom of the screen without the well point breaking suction.

The screen body is fabricated from galvanized low-carbon steel for normal water or from stainless steel for highly corrosive water. The all-welded continuous V slot design of the Johnson Green Head provides more open area than gauze-jacketed well points, and it entirely eliminates the need for a gauze jacket which is apt to tear open, say officials of the firm. The Johnson Green Head withstands rough handling under the most difficult dewatering conditions and may be completely demounted for cleaning or repairing any of the component parts.

For complete information write Edward E. Johnson, Inc., Dept. TD, 315 North Pierce St., St. Paul 4, Minn.

New Method of Sealing Threaded Pipe Joints

A new plastic tape called Tape-Seal, made from DuPont's Teflon (R), is now available for sealing threaded pipe joints.

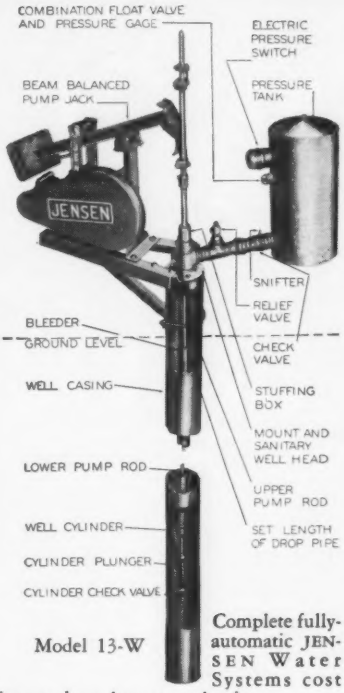
Advantages are said to include: (a) fast application (just wrap once around thread and tear off); (b) eliminates dripping or splattering; (c) unaffected by temperatures from –250° to 500° F; (d) completely inert, will not leach out or contaminate, is unaffected by acids, alkalies or solvents; (e) can be used with equal effectiveness on any type of metal or non-metal; (f) does not harden after application, permitting

(Continued on page 60)

JENSEN'S

Fully-Automatic

WATER SYSTEM



Model 13-W

Complete fully-automatic JENSEN Water Systems cost less to buy, less to maintain.

JENSEN JACKS are *perfectly counterbalanced* to give you more water with less power — up to 50 percent less!

15 models to choose from, for any depth to 5,000 feet.

Made by JENSEN BROS. MFG. CO., INC.
Coffeyville, Kansas

JENSEN
WATER SYSTEMS

How to On-The-Job Service

...the DURO

How many times have you sent a submersible back to the factory because local borrowed wasn't authorized under the pump's warranty?

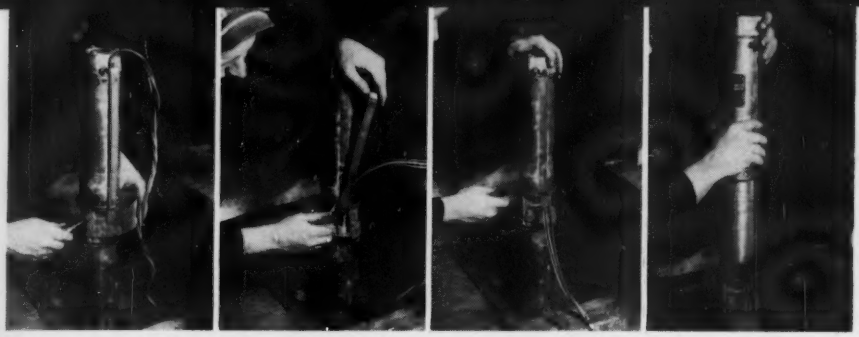
A Duro submersible is not only easy to service, but you can do it locally at wel site or repair shop so you can check for yourself exactly what is needed ... and you're still under warranty.

But even more important, the Duro Dutzen and Submersible is built to cut over all costs. Warranty or not, when it costs $40 to $45 to pull a submersible, you hate to hear that telephone ring. And that's where Duro quality pays off.

They don't build submersibles any more trouble-free than the Cutless Age. Duro's self-solvent coupling eases yours to pump life. Duro's 3-wire design keeps cable for starting switch and overload protection out of the well. Impellers and diffusers are cast bronze, precision machined—no substitute materials for Duro. And the special motor used by Duro stresses performance first, price second.

Give Duro quality a try on your next submersible job. Remember ... IF IT'S GOOD... DURO'S GOT IT!

JETS ... SUBMERSIBLES ... MULTISTAGE ... CENTRIFUGALS ... CELLAR DRAINERS ... RECIPROCATING

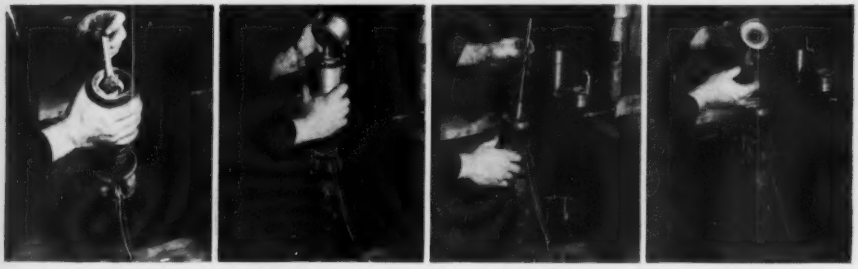


1 Remove solid brass strainer screen attached to pump base by removing brass screws. Not soldered.

2 Forget banding machines and cutters when removing brass cable guard. Both ends identical—can't be reassembled incorrectly.

3 Stainless steel pressure screws are removed from pump cap and housing sides with Allen wrench.

4 Slip off extra heavy brass pump housing. No threads, no solder to cause problems.



5 First step to removing impellers is to take off one nut with an end wrench.

6 Cast bronze, precision machined impellers and diffusers are individually removed. Not pressed together.

7 Stainless steel splined pump shaft lifts off motor coupling. No loose pieces, no separate small parts or impeller attachments.

8 Inspect for wear. No need to return entire unit if parts need replacement. To reassemble, reverse procedure.

Golden Ace

SUBMERSIBLE PUMP

NO SUBSTITUTE MATERIALS

Precision machined, hard bronze impellers and diffusers...stainless steel motor case...heavy brass housing. Only the best is good enough for Duro's standards.

NEW, LONG LIFE RESILIENT COUPLING

A totally new Duro feature that adds years to pump life by reducing vibration and promoting quietness.

THREE WIRE SERVICE

Above ground electrical equipment means less trouble. 200% minimum starting torque. Control box, supplied with each pump, includes heavy electrolytic capacitor, starting switch, and motor overload protection.

PUMPS · WATER SYSTEMS

SINCE 1915 DURO

DURO

THE DURO CO · DAYTON, OHIO

WATER SOFTENERS · FILTERS

The Duro Co., 537 E. Monument Ave., Dayton 1, Ohio

News . . .

(Continued from page 57)

easy disassembly; and (g) maintains pliable characteristics for easy application in both cold and warm ambient temperatures.

Because of its unique form-fitting properties, Tape-Seal does not "ride up" as pipes are joined but instead

Friesland's plastic sealing tape.

lubricates the joints and makes application easier. On-the-job cost is said to average between one and two cents per joint.

Tape-Seal is available in widths of ½, ¾ or 1 inch, in self-dispenser rolls of 250, 500 and 1000 inches; also in 70-inch do-it-yourself kits. Samples and literature sent on request. Write Friesland Plastics Co., Dept. TD, Friesland, Wis.

Tait Promotes Sales Personnel

The Tait Mfg. Co., Dayton, Ohio, has promoted two members of its sales staff.

J. Brand Laseter, formerly sales manager of the Rapidayton and Commander divisions, has become national sales manager. His duties have been expanded to include Taitco, the industrial sales division of the company. Laseter's new position will place him in direct charge of all field sales activities in the United States and Canada.

Laseter joined Tait in October 1953 as a sales representative in Florida.

George Griffin, formerly a member of sales promotion, has been moved up to the position of advertising and sales promotion manager. Griffin joined Tait a year ago.

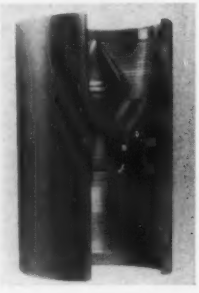
Clayton Mark Announces Plans To Purchase Illinois Firm

Plans to purchase Ken-Ray Brass Products, Inc., have been announced by Clayton Mark & Co., Evanston, Ill.

Spokesmen for Clayton-Mark said the Vermont (Ill.) firm will be operated as a subsidiary.

Founded in 1946, Ken-Ray manufactures brass pipe fittings, gas cocks, non-freeze faucets and hydrants and float valves.

New Check Valve Introduced by Reda



Reda Pump Co. has announced a new low resistance check valve, named the Reda Model AA Low Resistance Check Valve. Normal construction is "Ni-Resist" and stainless steel parts in steel housing. The valve seat is rubber cushioned.

This new valve gives less restric-

(Continued on page 62)

Greater *SURGE ACTION* with **new**

HYFLOW PERFORATION

Embossed for Strength

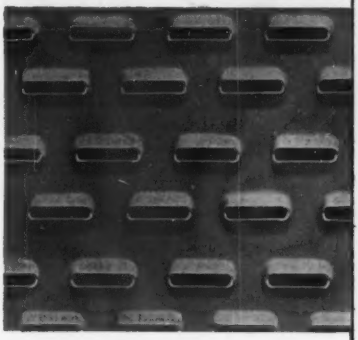
All-new HyFlow perforations run horizontally... *around* the casing. HyFlow has a corrugated, channel effect and is embossed... providing high resistance to lateral crushing.

Nozzle Effect

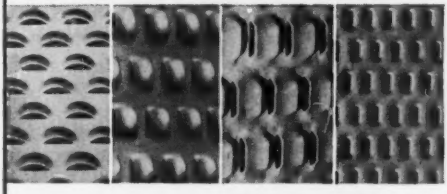
HyFlow has large, embossed openings for the ideal nozzle action for surging tight formations; self cleaning and non-clogging, for gravel packed wells.

*

Other perforations available for your ground conditions.



HyFlow perforations are about 1¼" long and up to ¼" wide. Available 8" diam. and larger in mild and stainless steels and other alloy metals. Square, smooth ends for true alignment. Shipping lengths 10 ft. multiples in popular 14", 16" and 18" diam. black casing.



Four Field Joints

Plain ends for welding; plain ends with butt straps and line-up holes for welding; lapped joints for either bolting or riveting.

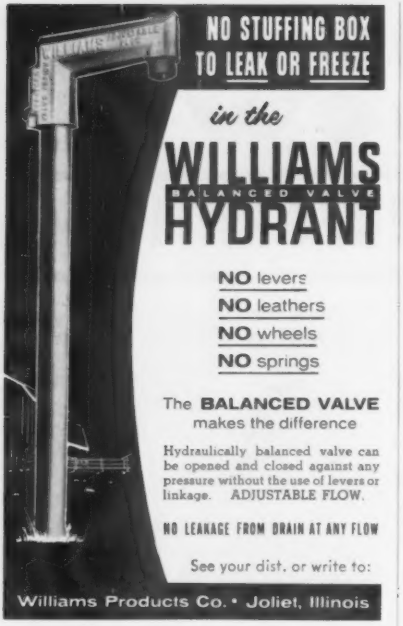
Write for **FREE** well casing catalog

THOMPSON PIPE & STEEL COMPANY

3007 Larimer Street • Denver 1, Colorado • TAbor 5-1241

Name..... Address.....

City..... State..... TP9-2


NO STUFFING BOX
TO LEAK OR FREEZE
in the
WILLIAMS
BALANCED VALVE
HYDRANT
NO levers
NO leathers
NO wheels
NO springs
The BALANCED VALVE
makes the difference
Hydraulically balanced valve can be opened and closed against any pressure without the use of levers or linkage. ADJUSTABLE FLOW.
NO LEAKAGE FROM DRAIN AT ANY FLOW
See your dist. or write to:
Williams Products Co. • Joliet, Illinois

News . . .

(Continued from page 60)

tion to flow through the use of two poppets instead of the conventional one poppet check valve. The operation is that of a valve in a valve! With the movement of fluid, the poppets begin to open, dividing the fluid between the two poppets. As flow increases, the openings also increase to maintain the least resistance to flow.

The advantages of the Reda Low Resistance Check Valve are the reduced head loss and increased savings —up to 75% of normal check valve loss, according to the company.

Further information will be furnished on request by writing Reda Pump Co., Dept. TD., Bartlesville, Okla.

Water Treatment and Purification Course Offered

Everpure, Inc., water treatment engineers and manufacturers of purification equipment, has established a comprehensive factory short course on water treatment and purification. The two-day course is offered free of charge to pump men and water system distributors and covers all major phases of water treatment problems encountered in the field.

Those desiring details on the school should write Everpure, Inc., Dept. TD, 2627 West 19th St., Chicago 9, Ill.

Lightweight Centrifugal Pumps Introduced by Aermotor

Aermotor Co., Chicago, Ill., has introduced a new series of CN centrifugal pumps designed to eliminate the bulk and cumbersome weight often found in general utility pumps.

Available in ⅓, ½, ¾ and 1 hp units, the CN pumps weigh only 36, 39, 44 and 49 pounds, respectively. Each model is equipped with steel mounting feet which require no expensive or heavy foundation.

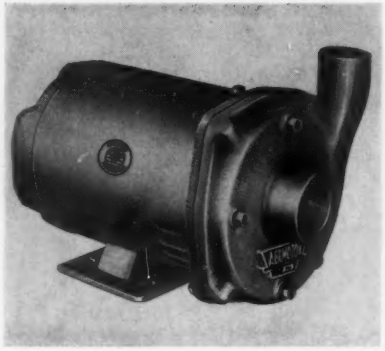
Other features of the CN are: the pump casing may be turned on the motor to give horizontal or vertical

When writing advertisers,

please say

you saw it in

THE DRILLER



Aermotor's lightweight centrifugal pump.

direction to discharge opening; the casing is equipped with both a drain and vent opening, the brass impeller is precision machined and balanced, the rotary shaft seal is sand-resistant; the capacitor-type motor requires a low starting current, has stainless steel drive shaft and has built-in thermal overload protection.

The new centrifugal can be used for booster service; liquid transfer; air conditioning and cooling systems; garden and lawn sprinkling; fire protection; filling tanks; draining pits, ponds, tubs, flooded basements and swimming pools; and for all general dewatering.

Additional illustrated information can be obtained by writing Aermotor Co., Dept. TD, 2500 West Roosevelt Rd., Chicago 8, Ill.

Bulletin Describes Submersible Pumps

Layne & Bowler, Inc., Memphis 8, Tenn., has released an informative bulletin entitled "Submersible Pumps." Detailed cross section drawings plus colored illustrations of the many and varied uses and applications of Layne submersible pumps make up the bulletin. Applications covered include: plant water systems, irrigation, reservoir pumping and municipal primary water supply.

The bulletin (No. 202) is free on request. Write Layne & Bowler, Inc., Dept. TD, Memphis 8, Tenn.

Sales Promotion Package Available from McDonald

A. Y. McDonald Mfg. Co., Dubuque, Iowa, has a new sales promotion package available for distributors and dealers of its pumps and water systems.

Termed the "Profit Pak," it contains a new combination broadside and wall poster, consumer literature, newspaper mats, publicity releases, radio scripts and a new publication, *The McDonald Mirror.*

Also included is a proof sheet of national ads, both consumer and trade, illustrating available mats for local advertising.

For further information write A. Y. McDonald Mfg. Co., Dept. TD, 12th & Pine Sts., Dubuque, Iowa.

Mailbag . . .

(Continued from page 44)

The length of the screen should be adjusted according to the formation, but, if the formation is clean, 30 or 40 feet of screen should produce somewhere between 300 or 400 gpm.

Because formations vary so widely, the screened and gravel packed well is generally a custom made job, built to fit the characteristics of a certain location. It is, therefore, always advisable to drill a test hole prior to the installation of the permanent well to obtain samples of the particular for-

(Continued on page 67)

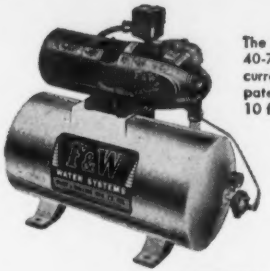
What do you want in the water systems you sell?

QUALITY

Naturally! And F & W advanced design, non-corrosive materials and precision manufacturing have been proved trouble-free and long-lasting in thousands of installations here and abroad, year after year. Every pump factory-tested for pressure and capacity. Every pump gets you a satisfied customer.

SALES ADVANTAGES

Not only sales advantages, but *exclusive* sales advantages! In shallow well pumps the patented F & W VARIJET is unapproached for efficiency and economy, gives 40 to 70% more water, yet uses less electricity. In deep well equipment, F & W's Automatic Control Valve produces maximum efficiency. The Speedichange Rotary Seal makes maintenance quicker and easier. These and many other important features make F & W *really sell!*



F&W VARIJET BULLET

The world's leading shallow-well pump. Pumps 40-70% more water, yet reduces motor load and current consumption, thanks to exclusive design patent. ¼-¾ H.P. Motors, 720-1800 G.P.H. @ 10 ft. & 20 P.S.I.

F&W MULTI-STAGE

Centrifugal pumps, available with 2, 3, or 4 stages, offer greater capacity per horsepower. Also give you cartridge-type rotary seal, priming valve and air pumping device. ¾-5 H.P. Motors. 2100-7200 G.P.H. @ 10 ft., & 20 P.S.I.

COMPLETE LINE

Here's another big advantage with F & W. You never have to over-power or under-power because there's an F & W model to meet all requirements exactly. One of the world's most complete lines.

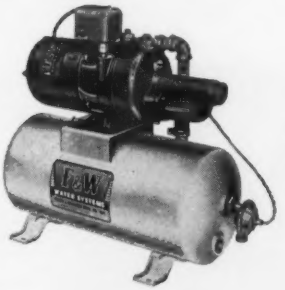
WELL-KNOWN BRAND NAME

Flint & Walling has been a leading name in pumping equipment since 1866, has pioneered many improvements including the first horizontal type jet pumps and the one and only VARIJET. F & W advertising in leading farm and consumer publications, as well as nation-wide distribution, continue to make F & W one of the most prominent names of all.

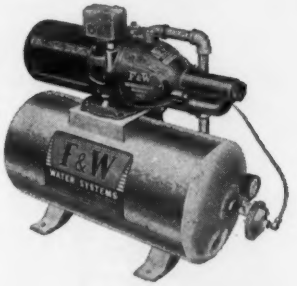
GOOD PROFIT

Not only does F & W provide worthwhile profit margins, but reasonable pricing, high salability, and trouble-free performance conserve your profit and protect it for you!

F&W
WATER SYSTEMS
Performance-Proved Since 1866



F&W ECONOMY MULTI-PURPOSE JET
The economical, multi-purpose jet equal in capacity to any comparable type, yet priced to meet volume competition. ½ H.P. Motor. 350 G.P.H. @ 15 ft. & 20 P.S.I.



F&W MULTI-PURPOSE
Converts from shallow to deep-well by moving jet off pump down into well. No extra parts to buy. ½, ¾, 1 H.P. Motors. Single-stage pressures to 60 lbs. and 450-950 G.P.H. @ 10 ft. & 20 P.S.I.; 2-stage to 100 lbs. and 540-810 G.P.H. @ 10 ft. & 20 P.S.I.

It will pay you to tie up with F & W, the well-known, easy-selling, profit line that leads the field in quality and product development. Send for F & W Catalog today.

FLINT & WALLING MANUFACTURING CO., INC.
997 OAK STREET, KENDALLVILLE, INDIANA

F&W means Flowing Water by Flint & Walling

What a selling plus! And what a wonderful way to be sure of satisfied customers! Point out *you* use *slit-proof* Orangeburg *SP*—the only plastic pipe Guaranteed and Bonded for 20 years for cold water service. *Under terms of the Bond, repairs or replacements* (INCLUDING LABOR COSTS) *due to failure of the pipe will be made at Orangeburg's expense.* The Bond will be made out in your customer's name; for him to keep. After your *SP* installation is completed simply mail *"Request for Bond"* Form to Orangeburg. After approval, Bond will be sent direct to your customer. Why not take advantage of this amazing Bond offer on your next job. See your Authorized Orangeburg Wholesaler or write Dept. D-99

Approved for drinking water by National Sanitation Foundation

ORANGEBURG MANUFACTURING CO. • Orangeburg, New York • Newark, California

A Division of The Flintkote Company, Manufacturers of America's Broadest Line of Building Products

Mailbag . . .

(Continued from page 63)

mation and to correlate the analysis with other pertinent data to take full advantage of the aquifer. Sand samples should be sent to screen manufacturers such as Edward E. Johnson, Inc., St. Paul, Minn., and Cook Well Strainer Co., Cincinnati, Ohio, for analysis and for recommendations as to the proper screen slot and gravel pack.

Bit Sharpening . . .

(Continued from page 29)

On cooling through that critical range, the carbon again comes out of solution, again as carbides.

These carbides may be either hard or soft. On slow cooling they are soft; on rapid cooling they are hard. In drill bits they should be hard, hence the quenching for rapid cooling. Soft carbides, however, develop so quickly that it is almost impossible in a mass of steel as large as the business end of a drill bit to transform all of the carbides to the hard state. In Fig. 10, the black area shows the time and temperature at which soft carbides form. Note that the time intervals increase in multiples of 10. Soft carbides form most readily at about 1000° F., and to prevent their formation, it is necessary to cool the steel to below 1000° F. in less than one second. When safely past that point, carbon will remain in solution until the steel cools to around 500° F. At that point, the carbon changes to hard carbide, which is wanted in bits.

For forge dressing large-diameter bits, some means other than hand

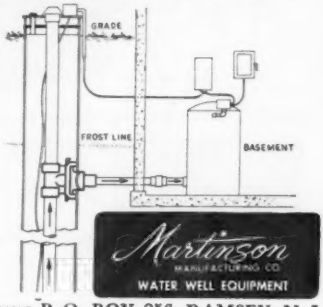
(Continued on page 72)

STOP WELL FREEZE UP

WITH *Martinson* UNDERGROUND DISCHARGE COUPLINGS

That's right, with Martinson patented pitless adaptors, it's both easy and sensible to make system installations below the frost line. No need to worry about digging deep for repairs in the future. With Martinson, the drop pipe can be disconnected at the surface. Low in cost, rugged, all-bronze construction. 1", 1¼", 2" for submersibles, 1¼x1" and 1¼x1½" for ejector pumps, and 1¼" and 2" for working heads.

See your supplier or write for literature, information.



Main Plant SHEFFIELD, IOWA Eastern Warehouse P. O. BOX 256, RAMSEY, N. J.

NOBODY . . .
BUT NOBODY
BUT . . .

SPANG

makes a completely

weldless

alloy-steel

jar

drills up to 4 times more footage-with fewer fishing jobs

For Cable Tool data and catalog see your Spang dealer or write to:

SPANG & COMPANY

DEPT. 0-6 • BUTLER, PENNSYLVANIA

For over 60 years Manufacturers of Spang Weldless Jars and a Complete Line of Cable System Drilling and Fishing Tools for Oil and Gas Wells, Prospect Drilling and Shot Blast Holes.

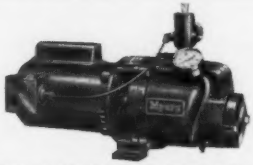
WIN *more pump sales*

WITH Myers®

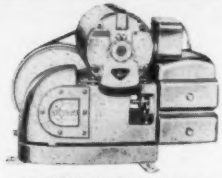
Myers dealers across the nation are winning the race for pump sales by wide margins. Because Myers dealers have *more* to sell, they sell *more!*

. . . with Myers, you get the best combination of pumps for your market: OLYMPIAN Jet Pumps, Reciprocating Pumps, Submersibles—plus, the only complete, local level business building plan in the pump industry. Includes year 'round co-operative advertising and a wide range of other FREE selling aids. Backed by a sensible national and regional advertising program that really goes after pump prospects for you.

LOOK AT THE MYERS LINE UP OF ALL-STAR PERFORMERS



OLYMPIAN (Convertible) JET PUMPS
for shallow or deep wells
⅓ to 2 hp.—capacities to 40 GPM



RECIPROCATING PUMPS
for shallow wells
⅓ to 5 hp.—capacities to 66 GPM

SUBMERSIBLE PUMPS
for deeper wells
½ to 15 hp.—
capacities to
240 GPM

. . . with Myers, your pumps are not "dust collectors"—they move from your stock, fast! Every pump in this great line of All-Star performers is designed and priced for dealer profit. For full details on how *you* can make money . . . with Myers, contact your Myers wholesaler today!

The F. E. Myers & Bro. Co.
ASHLAND, OHIO KITCHENER, ONTARIO

BITS *from the wit sharpener*

A wolf lounging in a hotel lobby perked up when an attractive young lady passed by. When his standard "how-de-do?" brought nothing more than a frigid glance, he sarcasmed, "Pardon me, I thought you were my mother."

"I couldn't be," she said, "I'm married."

Husband: "Well, at least you can't say I made any noise coming in last night."

Wife: "No, but the men carrying you sure did."

A man went to a physician, complaining of prolonged headaches. The doctor told him to stop smoking.

"I have never used tobacco in any form."

"Well, then, stop drinking."

"I am a total abstainer."

"Late hours, then, and fast women."

"I am always in bed by nine. I am a bachelor and live with my old maiden aunt. What else could cause my headaches?"

"I don't know," said the baffled doctor. "I guess your halo's pinching."

Wife: "Don't drive so fast, George. The policeman on the motorcycle right behind you wants to get by."

The pastor was shaking hands with the members of the congregation as they were leaving the services. He greeted a pretty lass who was not a regular member. "And where do you live?" he asked. She gave him an appraising look and then said, "I already got a fella."

"Looks like rig #8 just came in!"

"I won't offer you a drink, Mr. Kane," said the hostess, "since you're head of the Temperance League." . . . "No, I'm president of the Anti-Vice League." . . .

"Oh! I knew there was something I shouldn't offer you."

He had just completed 23 years in jail and his bosom was full as he stepped outside the gates. Surveying the country before him, he walked along jauntily, stopping to cry:

"I'm free! I'm free!"

A little girl, observing him, came over and said:

"That's nothing to shout about. I'm four."

It wasn't liquor that killed old John, nor women that stopped his breath; 'Twas a Volkswagen somebody drove up his leg, and tickled old John to death.

Look what happens when one of your customers hits the "Start" button on his BERKELEY TURBINE

He gets full-rated capacity at the pressure you promised. You *know* his sprinklers are putting out . . . that his ditches are full . . . because you hit his conditions right on the nose.

Why can you have this confidence? Because of Berkeley's broad selection of sizes. When you offer your customer a Berkeley, you help him select from one of the industry's most diversified lines. You are sure of finding a Berkeley Turbine to meet his conditions . . . every time.

Find out for yourself why Berkeley is one of the fastest growing lines in the business. Let Berkeley quality and service make you a "big leaguer" in the field. Send for our "Be a Berkeley Dealer" kit. Use your letterhead, please. If you act today, we'll send you a plastic covered note-pad with gold leaf for personalizing . . . absolutely free!

BERKELEY PUMP COMPANY

827 Bancroft Way, Berkeley 2, Calif.

FACTORIES IN:
Berkeley, Calif., Atlanta, Ga.,
Amarillo, Tex., Grand Island, Neb.

Berkeley
PUMPS & WATER SYSTEMS

For Over 22 Years

Bit Sharpening . . .

(Continued from page 67)

sledges should be provided. A bit ram is often used for this purpose. Because of its weight (some 400 to 500 pounds), it is suspended from a cable or chain actuated by man or machine power to strike against the bit face. When machine power is used, a bit ram drive may be purchased.

Avoid Damage

The ram drive is a simple device, consisting of an arm attached to the cathead and a length of pipe connecting this arm to the cable supporting the ram. As the cathead turns, the resulting crank action of the arm provides a reciprocative motion to the ram. To deliver its blows, the ram must be guided by a man holding the handle, so slow motion is preferred to avoid accident or damage through improper guidance.

Practical operation has proved that bits dressed by machine will drill more holes before requiring redressing than bits dressed by hand. The machine maintains the uniformity of metal and shape necessary for efficient drilling.

The contractor who drills large-diameter holes through relatively soft formations may find it easier and more economical to build up his large, heavy bits to gauge by electric welding rod. Many types of welding machines are on the market, any one of which will do the work in a given capacity range.

Ordinary welding rods are usually used to build up the bit wearing surfaces to almost gauge size. Then a hard-surfacing rod is used to provide wearing and shock-resistant qualities. Built-up rods must provide sufficient

White Flomatic Valves

If you want your pumps to produce with maximum efficiency and a minimum of service calls, be sure to use Flomatic valves. They're precision made of high quality bronze, with twenty years' experience behind them.

If your jobber can't supply you, write us.

Foot Valve

WHITE FLOMATIC

Check Valve

WHITE FLOMATIC DIVISION
Flomatic Corporation

Hoosick Falls, New York

yield strength and hardness to prevent cold flow in service and to avoid spalling of the hard surface weld metal. The hard-surfacing rod application should cover only a thin section, one pass being sufficient.

Though quite a few operators do not remove the bit from the stem for hard surfacing, better rod-flow application can be achieved if the bit is held in position to receive the down-flow of the rod metal. Many drillers have found that better service is achieved by preheating the bit slightly before applying electric welding rod for building up and hard surfacing.

It has been reported that applying the rod to a cool bit will eventually cause spalling. The reason is that stresses are set up in the cold steel around areas where heat from the electric weld is focused. Spalling occurs only occasionally in drilling soft, unconsolidated material, but it is more frequent in drilling hard rock. In the latter case proper handling of preheated bit steel tends to remove stresses set up during electric welding.

Matlock . . .

(Continued from page 35)

screen down into the bedded gravel and completed the well. I guess it pumped around 400 gph."

Matlock, who is a do-it-yourself man, built his own home. He also erected a two-car garage and a brick apartment building immediately behind his home, fronting 48th St. SW. A few blocks away is Matlock's 40 x 40-ft. cement block shop-office-store building. Mrs. Alma Matlock, wife of another brother, Sam, attends the shop in Matlock's absence and has been handling the bookwork since the beginning of this year.

McDONALD SUBMERSIBLE PUMPS

- SUPERIOR QUALITY
- ADVANCED DESIGN
- TROUBLE-FREE INSTALLATION

Choose from two models, 12 sizes, capacities to 1220 G.P.H., depths to 600 ft.

McDonald Series 6000 Submersible Pumps are designed for use in 4" wells and larger. The pump consists of lightweight, strong, perfectly balanced, polystyrene impellers mounted on a stainless steel shaft that is connected to the motor through a precision stainless steel coupling. The impellers have unusually smooth water passages which resist the effects of abrasion of iron or lime in well waters. Pump is totally enclosed in tamper-proof stainless steel jacket.

Lubrication-free—No lubrication is required for either the pump or motor unit. Both are water cooled and lubricated for life.

Capacitor-type motor—Motors are hermetically sealed, heavy-duty capacitor type for continuous operation. Available in ½ to 3 H.P.

Whatever your pumping needs for farm, home or commercial use, specify McDonald Series 6000 Submersible Pumps. Available either in the 8 G.P.M. or 20 G.P.M. sizes.

SERIES 6000

CERTIFIED PERFORMANCE

CENTURY

A. Y. McDONALD MFG. CO.
Dept. D 959, 12th & Pine
DUBUQUE, IOWA

Exclusive
Chromate Process
...for added life

and now...

Color Coded

CLAYTON MARK WELL POINTS

- Forged Steel One-Piece Body
- Galvanized—Even the Threads
- Every Gauze Mesh Color Coded
- Octagonal Forged Point for Easier Driving
- Chromated—for Greater Protection

for easy identification

NOW—you can identify Clayton Mark CHROMATED well points even in the darkest corner or on the highest shelf. Look for the brightly colored tips which indicate the correct gauze mesh. Remember too, that all Mark well points are CHROMATED to resist rust and corrosion—and that this exclusive protection lasts and lasts, even after the point is in the ground. Why be satisfied with less than the best well points when they cost no more? Ask for Clayton Mark Color Coded well points that LOOK BETTER, WORK BETTER, AND SELL BETTER.

CLAYTON MARK & COMPANY

1900 Dempster Street • Evanston, Illinois

WITH THE NEW 30-R

YOU MOVE IN

SET UP

DRILL YOUR WELL

and head for the next job FASTER than any other drill in its class!

You cruise to the site at full highway speeds . . . raise the derrick hydraulically . . . lower three hydraulic outriggers . . . rotate at any speed from 0 to 100 rpm . . . exert up to 30,000 pounds down pressure . . . add new pipe by "remote control" and finish in time to squeeze in that extra job you used to pass up — the job that brings you that important extra profit.

You can operate through a power take-off from the truck's engine (30-RP) or from a separate power unit (30-RS). You also have your choice of rotary for holes up to 7⅞ inches or down-the-hole tools.

Let your Bucyrus-Erie distributor show you feature-for-feature why you can be the well-diggingest guy around with a new 30-R. For complete details write Bucyrus-Erie Company, Drill Division, P. O. Box 324, Richmond, Indiana, Dept. 4W.

BUCYRUS ERIE

BUILDS BETTER EQUIPMENT

Harwell . . .

(Continued from page 39)

whole water well drilling field for a one man operation.

"Sometimes when I hear Homer start telling another driller about the qualities of our 22-W," says Mrs. Harwell, "I'm almost tempted to put the words down in writing and send them to the manufacturer for advertising purposes."

"Every time I have trouble you'll notice," Harwell chimes in, "it's not due to the performance of the drilling machine, but some unexpected formation. The other day, for example, I was on a job near Shawnee where I ran into quicksand and lost 25 feet of hole.

As a one man operator, Harwell has found it cheaper and more practical to have a local welding firm sharpen and repair his drill bits. "Besides," grins Harwell, "my wife insists that we go fishing every free day I have."

To prove that he does have free time occasionally, Harwell proudly brings out a big, mounted eight-pound black bass he and Mrs. Harwell caught on a recent fishing trip to lake Ouichita in Arkansas. "There's still a question though," Mrs. Harwell says, "just who caught the monster, for it took both of us to pull him in."

There are hundreds of 40-hour per week government employees in non-technical, medium-pay jobs in the Midwest City area who find it necessary and even profitable to hold down part-time jobs on their days off. But not one of them has found a more satisfying, more profitable or a faster growing self-operated business than have Homer and Mrs. Harwell with their Bucyrus-Erie 22-W.

VALLEY STEEL PRODUCTS COMPANY

Louisiana, Missouri

NEW AND USED WATER WELL CASING

LINE PIPE

ALL SIZES
ALL WTS.

IRRIGATION PIPE

GALVANIZED
BLACK

OIL WELL CASING AND TUBING

FREE QUICK DELIVERY — YOUR YARD OR JOB SITE
WATCH FOR OUR TRUCKS — THEY DELIVER IN YOUR STATE

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CALL COLLECT • BUY DIRECT

Service 24 hrs. per day for ***365 days a year***

ECONOMICAL PRICES • QUICK DELIVERY • SATISFACTORY SERVICE
WATER WELL CASING AND PIPE OUR SPECIALTY

BARGAIN *counter*

All advertising in this section is payable in advance. Enclose your check or money order with copy. Rate: $1.00 per line. Minimum charge $4.00. No discounts; no commissions. Count your own copy to avoid delay. The average line contains 28 characters (20 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number if blind advertisement is desired. Closing date — 5th of preceding month. Example — January issue closes December 5th. Be sure to address separate inquiries to each advertiser by using the correct box numbers. Mail Box inquiries care of THE DRILLER, South Milwaukee, Wis.

DRILLS FOR SALE

1—1957 Bucyrus-Erie 1-W rotary drill. Machine equipped with hydraulic rotary head, three-stage Moyno pump, 200-ft. 2¾" drill pipe, lines, bits, hoses, etc. Mounted on 1952 Dodge truck. This drill and truck are in perfect condition throughout.

1—Model 42 Cyclone. Machine equipped with telescoping derrick, power derrick hoist and Continental engine. No truck.

1—Model 44 Cyclone. Machine equipped with telescoping derrick, power derrick hoist and Continental engine. No truck.

1—Model 71 Star. Drill mounted on International truck.

1—Model 72 Star. Machine equipped with 6-cylinder Continental engine and casing reel. This drill is mounted on FWD truck. Both drill and truck are in excellent condition.

1—Model 282 Star. This machine has a casing reel, Ford industrial engine and is trailer mounted. Drill has capacity of 2,000 feet.

1—1957 model 28-L Bucyrus-Erie drill. Machine is trailer mounted and in perfect condition throughout.

2—Bucyrus-Erie 21-W drills. Machines are equipped with 32-ft. derricks. Both have been rebuilt and repainted. One has 4-cylinder Wisconsin engine and other has 4-cylinder Continental engine. Buckeye Supply Co., Box 1231, Zanesville, Ohio.

1—All steel 4" to 8" custom machine. 37' telescoping derrick, with pipe braces and power hoist, derrick shock absorber, slack line holder. Catheads. 20 hp LeRoi engine, equipped with transmission, 500' cables. Trailer mounted. Machine to be sold with 1950 Ford V-8 1½-ton service truck with water tank and closed tool boxes on side. PTO and air compressor. Price of both units, $1,975.

1—All steel 2" and 3" custom jetting machine. Single-tandem trailer mount. 29' telescoping derrick, with pipe braces and guy lines, power derrick hoist, bull reel, sand reel and catheads. Machine is set up on four adjustable jack posts. Power unit, 15 hp Wisc. air-cooled engine with clutch. Included with machine is gasoline-engine-driven jetting pump. Price, $1,975. Contact: A. L. Cox & Co., Inc., 202 W. Marion St., Mishawaka, Ind. Phone: BLackburn 9-3791.

30-Special Sparta drill, 60-L shock absorber and rubber-cushioned sheaves, 3,000 lb. capacity, semi-mounted. Attached drill platform, circle track, tool crane and electric hoist. All tools, bits, bars for 6" and 8" holes. 10" and 12" starter bits, fishing tools, tool subs, buckets, etc. Complete drilling equipment in fine condition. Write for complete list and price. Andrew Passehl. Box 255, Stratford, Wis.

1—Bucyrus-Erie well drilling machine, mounted on 1952 GMC 2-ton truck. Equipped with 4—6" bits, 1—8" bit, set of jars, bailer, drill bar, set of wrenches, tool box, about 400 feet of ¾" shell line and ⅝" sand line. Truck and machine in good condition. Price $3,000. New England Well Drillers, North Main St., Middleton, Mass.

1—1957 1-W, mounted on a 1-ton 1957 International truck with dual wheels. The machine is complete with lines and has utility boxes mounted on the sides. Machine and truck are like new. For further information contact Clifton, Pitman, Wentzville, Mo., or R. R. Long Co., Jacksonville, Ill. Phone CHestnut 5-2613.

K-2 Loomis, new 1955, mounted on Chevy Army truck. Complete tools and lines for drilling 6" hole. Recently overhauled and painted. A-1 condition. C. W. Lassen, So. Norwalk, Conn. VO 6-7888.

Failing 36 rotary, mounted on 53 Ford. 4½ x 5" pump, 375' drill pipe, 500-gallon tank mounted on 54 2-ton Chevy, welder, bits, subs, etc. R. F. Browning, Gering, Nebr. ID 6-5220.

1949 Ideco drill, w/32' telescoping derrick, power derrick hoist, catheads, 200' of wire lines. Power unit is 4-cylinder Continental, w/starting equipment. Machine mounted 1947 L.W.B. Chevrolet truck. Both machine and truck excellent condition. Complete 4" tools, in good condition, offered with machine. Contact Richard Henderson, R. R. #2, Kewanna, Ind., Phone Fulton, Ind. UL-7-3124.

Ideco 10 drill rig; 1-piece mast with Bucyrus-Erie shock; International U-164 engine, mounted on 1951 Chevrolet 6400 series truck; 500' ⅝" drill line; 500' ¾" sand line.

21-W Bucyrus-Erie drill, powered with Ford industrial engine; mounted on 1951 Chevrolet 6400 series truck; 500' ⅝" drill line; 500' ¾" sand line. James Shaver, 220 Orchard Place, Villa Park, Ill.

Churn drill, serial No. 26865, model 29-T. Equipped for drilling 6" and 9" holes. Weight of drill stem, 9", 2,600-3,000 lbs. Jack shaft, 2-7/16".

Bit dresser, serial No. 26866, No. 12. Complete with 1 ram die, 1 hammer die for 9" type "G" 500 lb. bits, 1 anvil, 1 pincap for 3¼" x 4¼", 7 API joint on bit, bit turning handle, 2 bit gauges.

The above two items are located at our Keigley Quarry works near Payson, Utah.

Churn drill, serial No. 26107, model 29-G. This drill is located at the Columbia Iron Mining Co., Desert Mound Mine near Cedar City, Utah. The Driller, Box 766, South Milwaukee. Wis.

#71 Star, 1953. 700-ft. lines, power hoist, catheads calf reel, 6 inch tools. On KB8 Int'l truck. Two-speed rear end. Good tires. Complete, $4,500. Ed Glidden, 124 Mill St., New Britain, Conn. Tel. BA 3-8935.

Berea production in central Ohio. 22-W drill, all tools. Service machine with hydraulic jacks. The Driller, Box 765, So. Milw., Wis.

DRILLS FOR SALE

1—1946 22-W, casing reel, spooling device and power derrick hoist. Has the 36 foot mast. No tools.

1—1948 22-W, with casing reel, spooling device and power derrick hoist. Has the 36 foot mast. No tools. For further information contact either Taber Well Co., Eureka, Mo., or R. R. Long Co., Jacksonville, Ill. Phone CHestnut 5-2613.

1—Home-built drilling machine, suitable for drilling 2" to 4" holes to depths of 200-ft. Motor on machine just recently overhauled. Machine mounted on Reo truck with dual rear wheels. Truck motor in good condition. Machine less drilling tools and cables. Wilson Pipe & Supply Co., Inc., 13400 W. Carman Ave., Butler, Wis.

Bucyrus-Erie 21-W well drill. Latest model bronze-bushed machine. Serial 71633. Mounted on 1946 Dodge 1½-ton truck with dual rear wheels. Has sand and drill lines. A fine looking machine. Has been well cared for and is in excellent condition. Price, $1,800. Now in our yard in Batavia, Ill. Larson-Becker Co., Bucyrus-Erie drill distributor, Batavia, Ill.

1—20-W Bucyrus-Erie drill, mounted on 1951 1½ ton Chevrolet truck. Machine has casing reel, partial starting, spooling device, with 5" and 6" drilling tools, 400' cable and sand line, 200' casing line, 5" and 6" slotted jar, two 20-ton hydraulic jacks, casing puller ring, fishing jar, combination socket, latch jack, jar bumper, 5" x 6'0" sinker bar. Machine and truck in good condition. Casey Szydlowski, 7570 So. Howell Ave., Milwaukee, Wis. Phone: SOuth 2-5070.

1—1958 60-L, trailer mounted. Used for only one well. Has 4-cylinder International diesel engine, rubber-cushioned sheaves. No tools or lines. For further information please contact Carl Larson of Andover, Ill. Phone: 1 or 37, or R. R. Long Co., RR #1, Mound Rd., Jacksonville, Ill. Phone: CHestnut 5-2613.

45 Armstrong, trailer mounted, 4" 20' stem, three 6" bits, 6'; jars and swivel socket, 2¼ x 3¼. $1,750. Albert Abbott, Rt. 1, Olney, Ill.

21-W Bucyrus-Erie, mounted on 1946 Int. truck. New gears, clutch and friction wheel. $1,450. Tools available. Bart Van Ingen, Webster, N. Y.

Bucyrus-Erie 22-W, mounted on good truck. A-1 shape. With cables. $4,500. Artesian Well & Supply Co., 195 Anthony St., East Prov., R. I. Tel.: GEneva 4-0198.

1—1954 20-W, with casing reel, spooling device, power derrick hoist and full electric starter. No tools.

1—1957 22-W mounted on a good Studebaker truck. It has casing reel, spooling device, power derrick hoist, full electric starter and lines. Newly cleaned and repainted. In A-1 condition. No tools.

1—Used bull reel brake housing for 24-L. For further information contact R. R. Long Co., RR #1, Mound Rd., Jacksonville, Ill. Phone CHestnut 5-2613.

50A Keystone, mounted on Mack truck. Equipped with 48' derrick, power-raised, catheads, tool guide, casing reel, starting equipment, catheads. Powered by Hercules QXB-5 engine with four-speed transmission. Has 6" tools and lines. Machine in excellent condition throughout. Price, $5,500 complete. The Driller, Box 769, So. Milwaukee, Wis.

20-W Bucyrus-Erie mounted on Ford truck. Machine purchased new 1951. Is in good condition. Price complete, with tools for drilling 6" and 5" wells — $3,000. H. R. Ducey, Milwaukee, Wis. Phone FLagstone 2-2920.

1—21-W Bucyrus-Erie drill, mounted on Ford truck. Complete line of tools. In very good shape. L. L. Rothenberg, 17802 Ridgeland Ave., Tinley Park, Ill.

20-W Bucyrus-Erie drill, serial #75849, without casing reel but with power derrick hoist and spooling device. Mounted on 2-ton 1950 Chev. truck with dual rear wheels. With tools for 6" holes. Has drill and sand lines. Truck and drill in good condition. Clarence Acker, 3934 S. 41st St., Milwaukee, Wis. Phone: OR 2-5667.

Ideco #16, trailer mounted, 40' telescoping derrick, power derrick hoist, LeRoi 202 engine in excellent condition. Rig has casing reel, catheads, 800' ¾" drill line, 100' ¾" sand line. Rig recently overhauled. Phone 2623 or 2277, Danville, Kentucky.

1958 model 50 Keystone-Franks rotary; in A-1 condition; purchased August 1958. Also, late model 50 Keystone spudding machine, truck mounted, with tools. Price $2,600. Somerville Well Drilling Co., 14 Fairmont Ave., Somerville, N. J. Phone RAndolph 5-0171.

Mayhew rotary air drill, complete with Mayhew split shaft power take-off for powering drill unit from truck engine; enclosed chain-driven power transfer case; Mayhew heavy-duty, three-speed transmission on rotary table drive; model 2003 rotary table; powerflo chain pulldown with 1½" pitch chains; double drum draw works with two CL-311 friction clutches; 31" mast, raised and lowered with two hydraulic cylinders; hydraulic oil storage tank with strainer; Vickers hydraulic oil pump; Vickers hydraulic control valve; heavy-duty swivel and kelly head assembly (28,000-lb. capacity); 3¼" x 23' fluted Kelly bar; Kelly head adapter; Kelly adapter to drill pipe; Kelly drive bushing; 2" pressure hose and standpipe to swivel; all cables; hoist plug; break out blocks (slips); model WCG Gardner-Denver air compressor with air receiver, air gage and pop-off valve; tachometer at rear of drill; 618 breakout wrench; clearance lights with conduit and reflectors installed on drill bed, drilling lights installed; unit primed and painted and mounted on Euclid model 27FD 2751 with HR Cummins diesel engine. Brake lock system installed. Price $15,000. L. G. Everist, Inc., 307 Poulton Bldg., Sioux Falls, S.D.

24-L Bucyrus-Erie, mounted on 6x6 International truck; machine equipped with 48' derrick—power-raised—casing reel, spooling device, starting equipment, tool guide, blower, catheads and powered by Buda HP-326 engine; with lines and 6" tools. Excellent condition throughout. Price $7,000. Additional tools available at extra cost. Clearwater Artesian Well Co., Royce Rd., Marlboro, Mass., Phone 465.

36-L Bucyrus-Erie No. 45059 Complete set of tools from 12" to 5", metal dog house. K light plant, bit rack, iron sled, wood sled. Machine in good shape. Buda motor has just been overhauled. Rig is running every day near Princeton, Ind. No letters. Come see, or phone ST 5-2152, Wheeling, Ind. Price, $15,000, cash. Gary Welch.

1—1948 Keystone 50. Machine on GMC truck, 5-ton cap. With or without 6" tools.

1—1955 Speed Star Keystone machine on 2-ton International truck. With or without tools.

1—1933 Armstrong machine, on 2-ton International truck. With or without tools. J. J. Kocian, Richards Ct., So. Norwalk, Conn. Ph: TE 8-1276.

DRILLS FOR SALE

1—24-W, mounted on a 1947 K8 International truck, good throughout; also machine in good condition. Has 1,500′ new ¾″ drill line and 1,200′ 7/16″ sand line. Price, $4,800.

1—22-W, mounted on a 1947 K5 International truck; both machine and truck in good shape. Has 300′ ¾″ drill line and 300′ 7/16″ sand line. Price, $4,500.

Have 1 complete Buda for 24-W and 1 short-block assembly for same size. $150 takes the 2 motors. Also have 6¼″ bits with 2½ x 3½ pins. Will sell cheap. Douglas Holzem, 1975 Prairie Ave. Beloit, Wis. Phone: EMerson 2-3922.

22-W Bucyrus-Erie, 1954 model, mounted on a Studebaker 2-ton truck. Drill equipped with Hercules engine, casing reel, stem guide, catheads and rubber sheaves. Complete tools and lines for drilling 6″ diameter wells. Outfit in excellent condition and can be purchased for $4,800. Fishing tools and additional drilling tools are available at extra cost. M. W. Ives & Son Well & Pump Co., Rt. 202, Mt. Ivy, Pomona, N.Y. Phone HAverstraw 9-5268.

22-W Bucyrus-Erie well drill, tools and truck. Contact Alex Petrosky, RD #2, Wilkes-Barre, Pa. Phone VAlley 4-4285.

Available for immediate shipment — subject to prior sale:

Model 1-W well drill, demonstrator, good operating condition. Type D, for truck mounting (less truck) has IH-UC60 engine, complete electric starting, L.H. cathead, hydraulic rotary drive unit, rotary weights, centrifugal pump, piston pump, casing block, drilling cable and sand line.

1—Moyno pump, type CDQ, capacity 56 gpm at 50 psi at 600 rpm, powered by AEN Wis. engine, 7.0 brake horsepower at 2,400 rpm, complete with base.

Assortment rotary & cable tools: 4 rotary tricone bits, 12 mills finger bits, 4 Hawthorn finger bits and 3 carbide insert blades; drill rod, casing elevators, misc. tools and fittings. Sale price complete, $7,000 FOB Richmond, Ind.

Write, wire or phone today for free information. Bucyrus-Erie Co., Drill Div., Richmond, Ind. Phone 2-6111.

MISC. FOR SALE

9 cubic ft. Hayward orange peel bucket, old, reasonable price. Joe Rammel, RR 1, Box 42, Ft. Recovery, Ohio.

New pipe casing in stock: 3″, 4″, 6″, 8″, 10″, 12″. Reconditioned pipe casing in stock: 3″, 4″, 4½″, 5″, 6″, 8″, 10″, 12″. Cutting and threading facilities; attractive prices on request. H. Schwartz & Sons, 2235 N. Bodine St., Phila., Pa., GArfield 6-6464.

1—New Rampp 4″, 2-blade underreamer, 1½ x 2¼″ jts. $360.

1—Used 6″, 2-blade underreamer, 3¼″ jts. $325.

1—Used 8″, 2-blade underreamer, 3¼″ jts. $350.

1—New Spang 6″ casing cutter, 3-blade, with mandrel and jars. $225.

1—New Spang 6″ casing cutter, 4-blade, with mandrel and jars. $275. Hickory Well Supply Co., Inc., P. O. Box 602, Hickory, N. C.

500′ pocket size water level indicator, complete, ready to use, with one extra spud. Price: $21 post paid. C. W. Lutts, 705 Plaza Serena, Ontario, Calif.

New and used pipe and casing. Also used well drilling rigs. Tom's Well Driller Supplies, 1225 Lancaster Ave., Reading, Pa. Phone SPruce 7-6331.

WELL BUSINESS FOR SALE

1—160 Howell, mounted on 1948 GMC 6-ton truck, 1,000-ft. ⅝″ cable and 1,000-ft. sand line. 200-amp. Lincoln welder, mounted in front of drill. 1 — 21-W B-E drill, mounted on 1953 3-ton Ford truck. 600-ft. drilling line and sand line. Has 200-amp. Hobart welder, mounted between cab and drill. Tools: 1—8″ underreamer, 5 stems, 3″ to 8″ holes; 1—4″ Perfection underreamer; 2 — inside pipe cutters, 3″ and 4″; 1—10″ diameter Mud Scow; 2 — 20-ton jacks; 2 — 15-ton jacks; 1—Portable mud pump, with M.M. power unit; 1,000-ft. jetting pipe, with bits up to 5″; 1—2-ton 1949 Stude. truck, with combination tank, 600-gal. water, 175 gasoline, gas engine, centrifugal pump; 1—1948 ¾-ton Ford pick-up, 400-gal. water tank and gas engine, centrifugal pump. Approx. $5,000 of pipe and supplies. Four lots in Westby, one home-made trailer house used to store supplies. Business is good but wish to retire. All goes for $18,000. Half down, balance in monthly installments. Phone DU 5-4471 or write Gust R. Lagerquist, Westby, Mont.

A well established water well and pump business, southeastern Michigan. It includes 5 machines, service trucks, tools for wells from 2 to 12″, plus valuable real estate, consisting of brick home, pump display room and office. Shop building on main highway. The Driller, Box 767, So. Milw., Wis.

MISCELLANEOUS

Wanted—Cable tool contracts or subcontracts in Canada or Alaska. Write Gary Welch, RR #1, Francisco, Ind.

WELL BUSINESS WANTED

Would like to buy a small well drilling business in the midwest. The Driller, Box 768, South Milwaukee, Wis.

POSITION WANTED

Shallow water expert, with exclusive water-finding service, desires position in the field with reliable pump company. Herman Bernau, Ogden, Iowa.

HELP WANTED

Experienced, reliable well driller to work on 22-W. Knowledge of rock and screen work desired. Capable of starting and finishing job. Geo. A. Schmalz & Son, RR #5, Box 40, Rockford, Ill. Ph: WO 5-0780.

Cable tool and rotary water well drillers for overseas. Work reference and martial status in first correspondence. No drinkers. Box 182, Scobey, Mont.

Wanted at once — reliable rock driller for 22-W drill. Good pay and opportunity. Twin State Well Co., Box 62 Bethel, Vermont.

Experienced, reliable cable tool driller for rock and screen work. Stewart Bros. Inc., P.O. Box 967, Schenectady, N. Y.

Experienced, reliable cable tool driller, 4 and 5″ work. Steady with paid vacations and holidays and hospitalization. McHenry County Well and Pump Co., Rt. 4, McHenry, Ill. Ph: 713.

"This flexible pipe helps us give quicker service at lower cost"

says California well driller

"We can give quicker service at lower cost using pipe of ALATHON 25," says Robert Crow of Stockton, California. "And we find that installing pipe made of ALATHON saves us the trouble of hauling special pulleys, ropes and other equipment. One man can uncoil this pipe and put it in place. We can assure our customers there will be no breakdown from electrolysis or corrosion. And pipe of ALATHON 25 will not rust or give taste and odor to the water."

Now available to drillers is pipe made of ALATHON Super 25 polyethylene resin, an improved form of ALATHON 25. A product of constant research in the Du Pont laboratories, ALATHON Super 25 makes the most durable, flexible pipe available. Insist on the pipe with the green tag and the words—"Quality Pipe Made of Du Pont ALATHON Super 25".

ALATHON *is the registered trademark for Du Pont's polyethylene resins.*

ALATHON Super 25

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

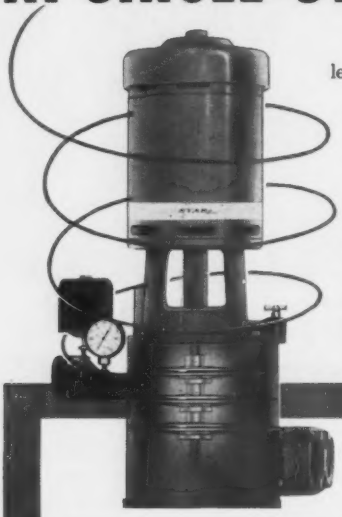
Du Pont does not manufacture pipe, but supplies ALATHON® Super 25 polyethylene resin to leading pipe extruders.

nsf

Now from the originators of Jet pumps...

STAR line

NEW HIGH-PRESSURE MULTI-STAGE WATER SYSTEMS AT SINGLE-STAGE COST!



Latest triumph of Jacuzzi Bros. engineering leadership... the new STAR line... five completely new series of water systems... every pump a multi-stage unit to provide more water at higher pressures... plus greatly simplified mechanical design and important new engineering improvements... all at the cost of an ordinary single stage pump!

FOR DEEP WELLS — self-priming jet systems for lifts to 400 feet.

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SUBMERSIBLES, TOO — for 4, 6, & 8 inch diameter wells and larger.

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STAR line PUMPS AND WATER SYSTEMS

Contact us for literature and dealership opportunities

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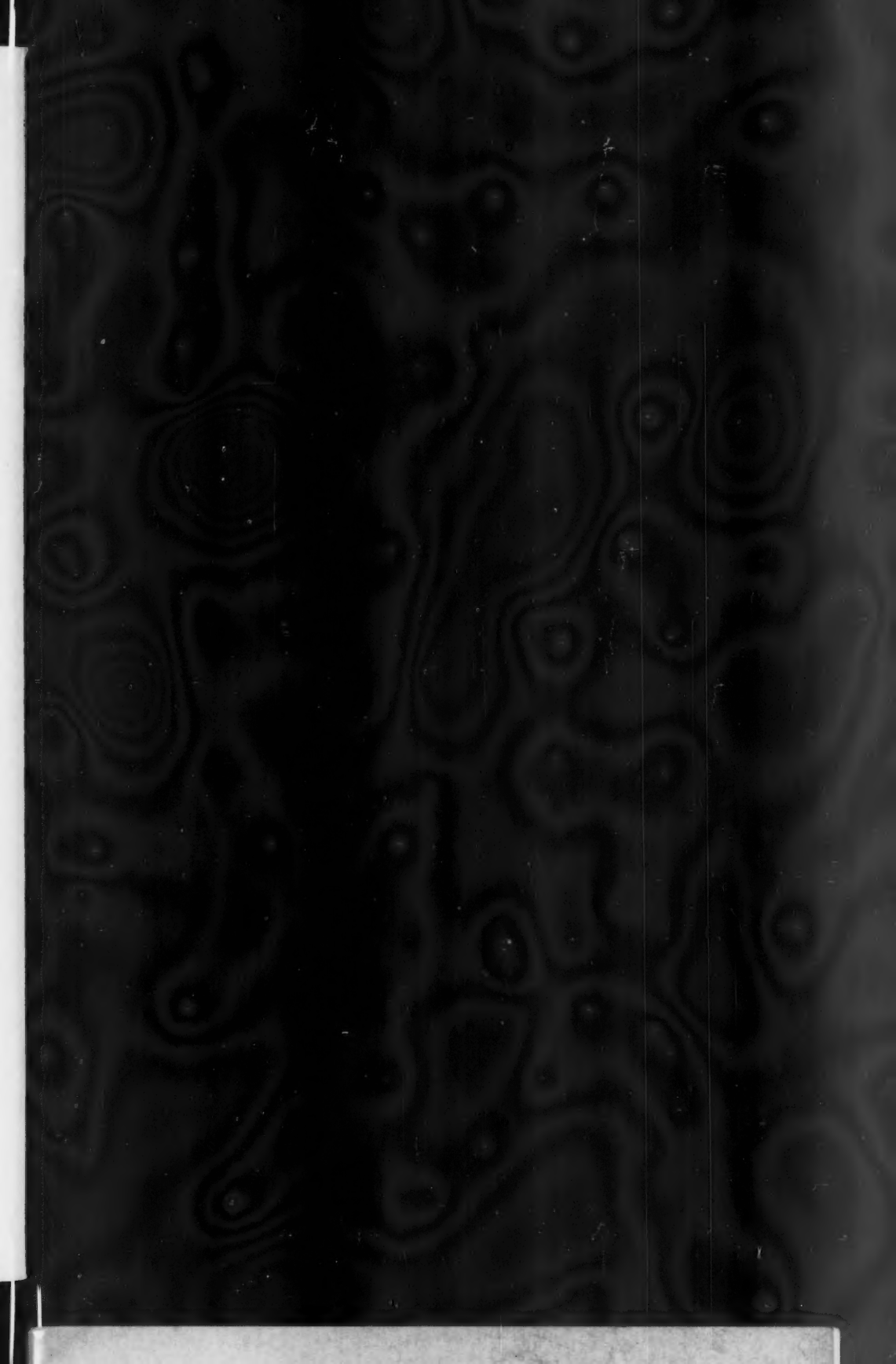
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